Public Utilities

Volume 66 No. 5 September 1, 1960

CAN REGULATORS BE JUDGES?
By Louis J. Hector

« »

Liberal Line Extension Policies Can Be Profitable
By G. C. Delvaille and Arthur D. Baldwin

« »

Nuclear Energy's Growing Pains—Practical Problems Ahead
By John E. Gray

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Public Utilities FORTNIGHTLY

VOLUME 66 SEPTEMBER 1, 1960 NUMBER 5

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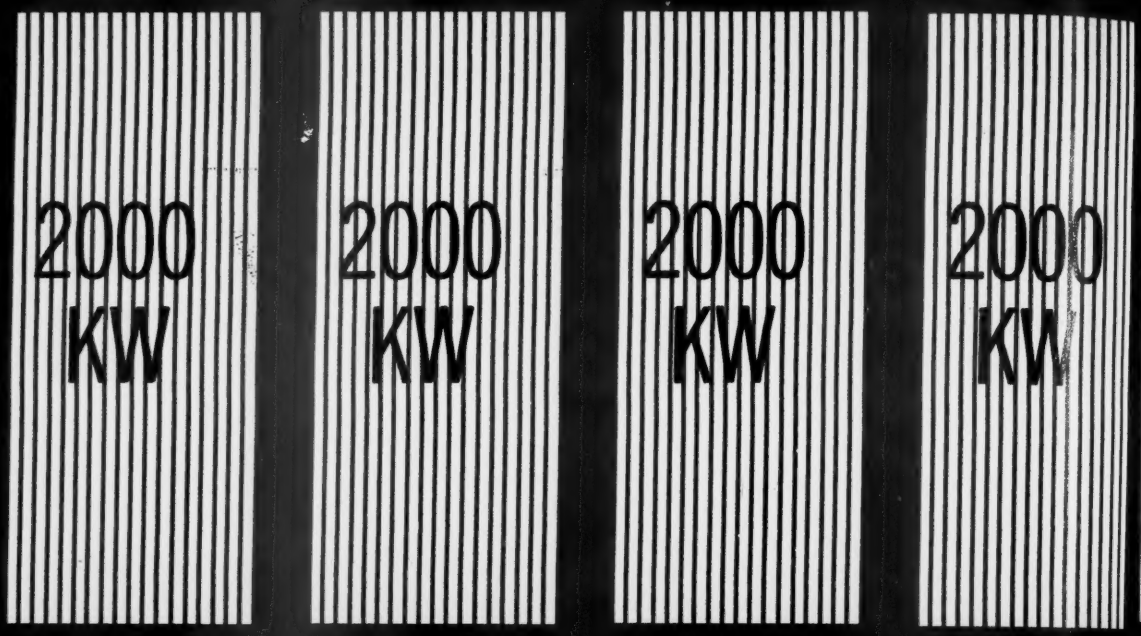

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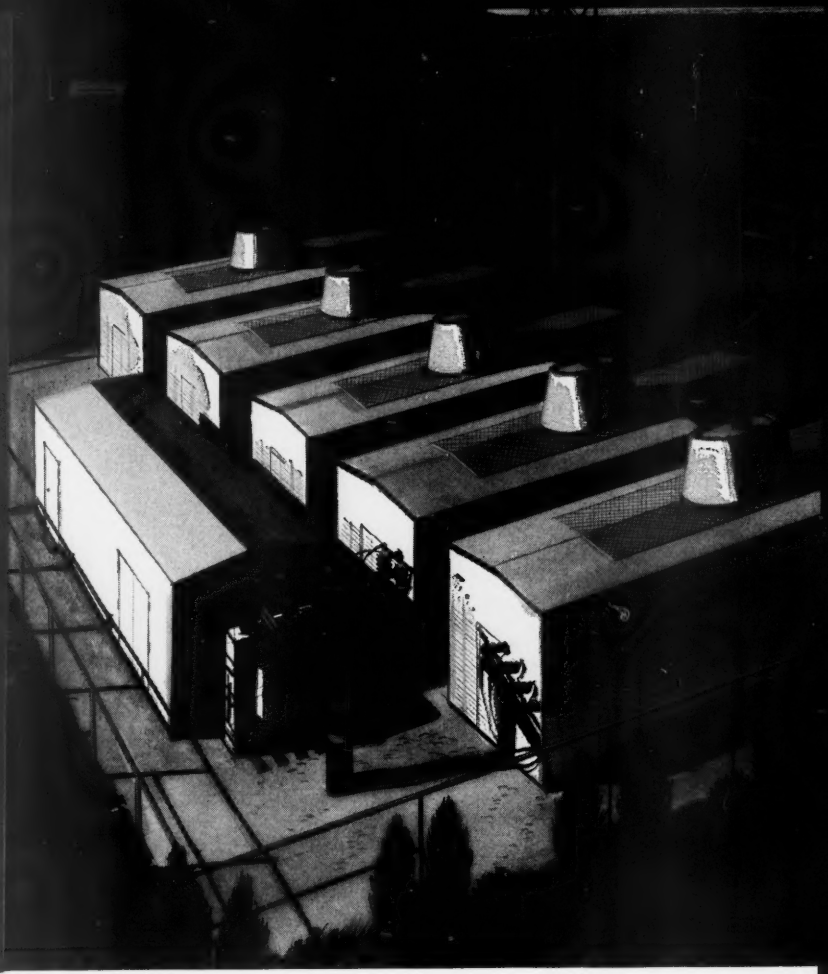

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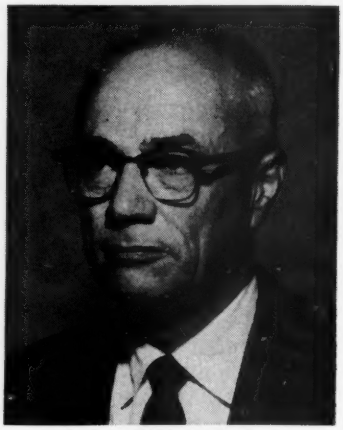
Pages with the Editors

Now that Congress is back in session for a political, if not a legislative, jamboree, we hear recurrent demands from the politicians that the United States must "catch up" (presumably with the Russians) or "keep ahead" on a number of things, including a nuclear energy program. Actually, we have no way of knowing just how many nuclear plants the Russians have for producing electricity and on what scale they have been or are being developed. Following their usual custom, the Soviets are not telling the world in any detail. But if the Russians are as smart as a great many people give them credit for being, the chances are good that they have not gone head over heels into an ambitious, enormously expensive program for the production of electricity from nuclear energy at a cost considerably in excess of the cost for conventionally generated power.

Of course it is all very well for some people in Congress, whose business it is to spend the taxpayers' money rather than their own, to make ambitious demands along this line. But it is something else again for private electric companies to ask their shareholders, as well as regulatory authorities, to approve the expense of constructing and operating plants for the production of electricity at a cost known in advance to be in excess of conventional power.

LOUIS J. HECTOR



G. C. DELVAILLE

The fact that three nuclear plants are now in operation and contributing to public power supply through public utility operations, and seven more are being constructed, and a dozen more are in the planning stage, speaks well for the willingness of private industry to contribute and co-operate with the Atomic Energy Commission. Nobody has claimed that these plants are now delivering or will ever deliver economically competitive power, although presumably there will eventually be nuclear plants in that category. The present program, however, must be written off, in part at least, to necessary research development and experience. It is for this reason that care must be taken by all involved to see that the right ultimate decisions are made as to which of the various techniques being tried offer the most promise of eventual economically competitive power production and to narrow the cost gap until that day arrives.

The article in this issue on nuclear energy's growing pains, which begins on page 306, is an attempt at realistic appraisal by an author who has served in the past as AEC's technical and manu-

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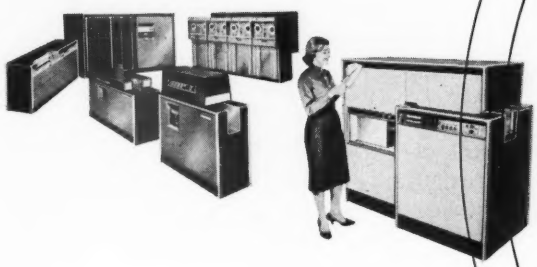

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facturing director at the Savannah river (H-bomb) plant. He has also been project manager of the Shippingport project of the Duquesne Light Company. He is JOHN E. GRAY, now president of Nuclear Utility Services, Inc., of Washington, D. C. A graduate of the University of Rhode Island (1943), he started his career with the Westinghouse Electric Corporation and was assigned to the Manhattan (A-bomb) project. He also worked with General Electric's Knolls Atomic Power Laboratory and the Hanford (plutonium production) Works. He joined the Shippingport project in 1954, becoming superintendent of construction and co-ordinator of that atomic project.

* * * *

IT was little over a year ago that COMMISSIONER LOUIS J. HECTOR resigned from the Civil Aeronautics Board and sent to President Eisenhower a lengthy memorandum expounding his views on the shortcomings of modern federal commission regulation in general and the CAB in particular. Since returning to his law practice in Miami, MR. HECTOR has given some additional thoughts to this subject, which he outlined in a recent address to the Great Lakes Conference of Railroad and Utilities Commissioners at White Sulphur Springs. The opening feature in this issue is a restatement, in article form, of MR. HECTOR's present views on this controversial subject. A native of Fort Lauderdale, Florida, MR. HECTOR was educated at Harvard, Williams, and Oxford prior to graduating

ARTHUR D. BALDWIN

JOHN E. GRAY

from the Yale Law School (LLB, 1942). He entered government service in 1942 as a Justice Department attorney, and subsequently saw service with the Office of Lend-Lease Administration, with a State Department mission to England, and with the Office of Strategic Services with the Southeast Asia Command. He was appointed to the CAB in 1957.

* * * *

THE joint article on liberal line extension policies, which begins on page 297, comes to us from the vice president of California Electric Power Company, G. C. DELVAILLE, and the assistant rate engineer of that company, ARTHUR D. BALDWIN. MR. DELVAILLE is a native of France, who graduated from the Massachusetts Institute of Technology and became an American citizen. He started working for Southern Sierras Power Company (predecessor of his present organization) in 1926. MR. BALDWIN is a native of southern California, who graduated from the California State Polytechnic College (BS, 1951) after service with the U. S. Navy in World War II. He joined Pacific Gas and Electric Company the year he was graduated and California Electric in 1953.

THE next number of this magazine will be out September 15th.

The Editors

atomic progress

THROUGH

58 YEARS

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In 1952 Pioneer joined with other groups, all reporting to the Atomic Energy Commission, for constant study of atomic energy application. Today Pioneer is qualified as a consultant to industry in the application of atomic reactor systems to the generation of electric power. Presently, Pioneer is acting as architect-engineer and supervisor of construction of the 66,000 kw commercial atomic power plant shown here. Allis-Chalmers Mfg. Co. is the prime contractor. Scheduled for 1962 completion, the plant, for the Northern States Power Co., will be known as the "Pathfinder".

Organized as Central Utilities Atomic Power Associates, these utilities will share in the research and development costs: Northern States Power Co., Central Electric and Gas Co., Interstate Power Co., Iowa Power and Light Co., Iowa Southern Utilities Co., Madison Gas and Electric Co., Mississippi Valley Public Service Co., Northwestern Public Service Co., Ottertail Power Co., St. Joseph Light and Power Co., Wisconsin Public Service Corp.

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Sketch of "Pathfinder" commercial atomic power plant

Coming in the Next Issue...

(SEPTEMBER 15, 1960, ISSUE)

THE CONSUMER'S REQUIREMENTS FOR COMMERCIAL NUCLEAR POWER

How valid are the claims—which seem to come mostly from legislators, charged with spending taxpayers' money instead of their own—that the United States has either fallen behind or is not keeping up with the international contest to establish nuclear power generation at an economically competitive price with other fuels? Of course, what is an economically competitive price for nuclear power in areas, such as Europe, could be very expensive and wasteful power indeed in comparison with steam or hydro generation in the United States with its abundance of fossil fuels and natural resources. Robert C. Woodbury, New York attorney and engineer, formerly associated with both Army and Navy nuclear reactor programs, feels that the many projects and plans now being completed or under way by privately owned electric utility companies demonstrate that this nation will sustain its leading rôle in developing nuclear energy.

AN ANSWER TO THE HIGHWAY FIASCO

Cities can solve traffic and many related problems for all times by re-establishing competent and attractive systems of mass public transportation. But the author of this article, E. F. Downs, Chicago transportation engineer, feels that the blandishments of the "highway lobby" and the "automotive lobby" have so impregnated the thinking of our lawmakers and policy planners that the present sorry state of urban and interurban transportation congestion will get much worse before it gets much better. This author thinks that other public utility industries, notably gas, electric, and telephone companies, have a definite stake in re-establishing a sound system of mass transportation in contrast with the wasteful pouring of public funds into superhighways and expressways which never catch up with the growing problems of traffic snarls, slum cities with decaying hearts, and allied burdens of the mid-twentieth century. Monorail is among the alternatives suggested.

THE REGULATORY COMMISSION AND THE PRESS

The need for public relations and competent specialists to look after them has long been felt in most industries, regulated and unregulated. Even cultural and educational institutions have felt the importance of making and keeping as many friends as possible. So it is not surprising that commission regulation, as an institution, has found that it requires professional skill to keep its relations with public opinion on an even keel. J. O. Brice, informational representative, public utility commissioner of Oregon, has written a practical, down-to-earth analysis of the problems with which the state commission's public relations officer must cope and what to do about them.

AND IN ADDITION . . . ***Special financial news, digests, and interpretations of court and commission decisions, general news happenings, reviews, Washington gossip, and other features of interest to public utility regulators, companies, executives, financial experts, employees, investors, and others.***

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Remarkable Remarks

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CHARLES DE GAULLE
President of France.

"Failing the renunciation of atomic armaments by those states who are provided with them, the French Republic obviously will be obliged to equip itself with such armaments."

DWIGHT D. EISENHOWER
President of the United States.

"Believing in our God, believing in the convictions that we have inherited from our forefathers, we will yet have a world in which a just peace will be the lot of men, in which they can realize and use the fruits of their own toil."

HARLLEE BRANCH, JR.
President, The Southern Company.

"Government can assist or it can frustrate, but it cannot create long-term economic improvement, or even a short-term and illusory economic uplift without destroying human freedoms and distorting the economic patterns essential to lasting prosperity."

EDITORIAL STATEMENT
The New York Times.

"Those who have long opposed TVA because they believe it is partly supported at the expense of the taxpayer might be expected to welcome the proposal to let it pay its own way by going into the private money market with revenue bonds. They do not seem to agree; we scarcely know why."

CHARLES H. PERCY
President, Bell & Howell Company.

"The businessman should not . . . participate in politics as a businessman, but rather as a citizen. For when individuals use political office only to further the cause of an interest—whether that interest be business, labor, agriculture, or veterans' benefits, government by citizens may become government by pressure groups, and the legitimate objectives of democracy are subverted."

GEORGE ROMNEY
President, American Motors Corporation.

"The real issue is not local working conditions or inflation, important as these issues are. The real issue is America's survival. The basic problem lies in antiquated labor and antitrust laws that are in conflict and that encourage aggregation of power that permits a handful of men to pull the switch on the entire U. S. economy. In the present status of world affairs, this is a situation we can no longer afford."

BARRY GOLDWATER
U. S. Senator from Arizona.

"The natural function of a trade union and the one for which it was historically conceived is to represent those employees who want collective representation in bargaining with their employers over terms of employment. But note that this function is perverted the moment a union claims the right to represent employees who do not want representation, or conducts activities that have nothing to do with terms of employment (for example, political activities), or tries to deal with an industry as a whole instead of with individual employers."

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Port Everglades

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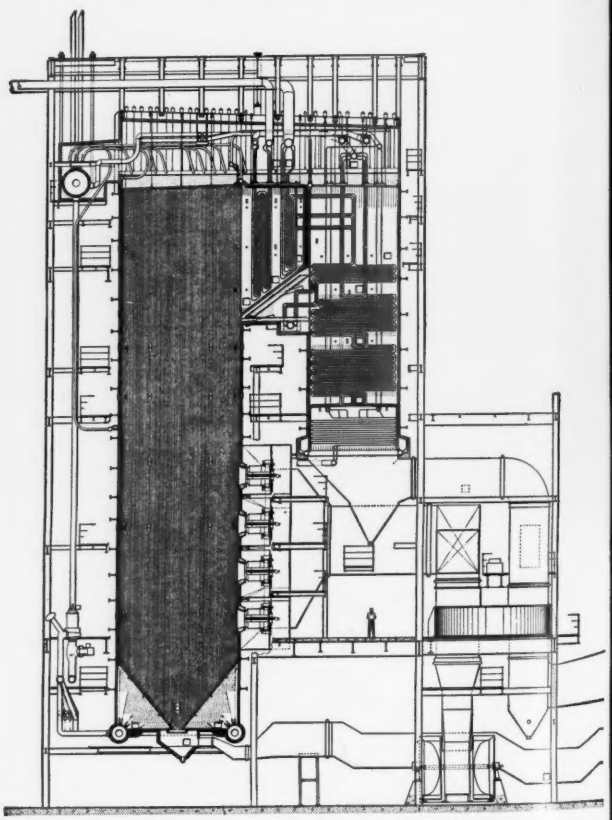
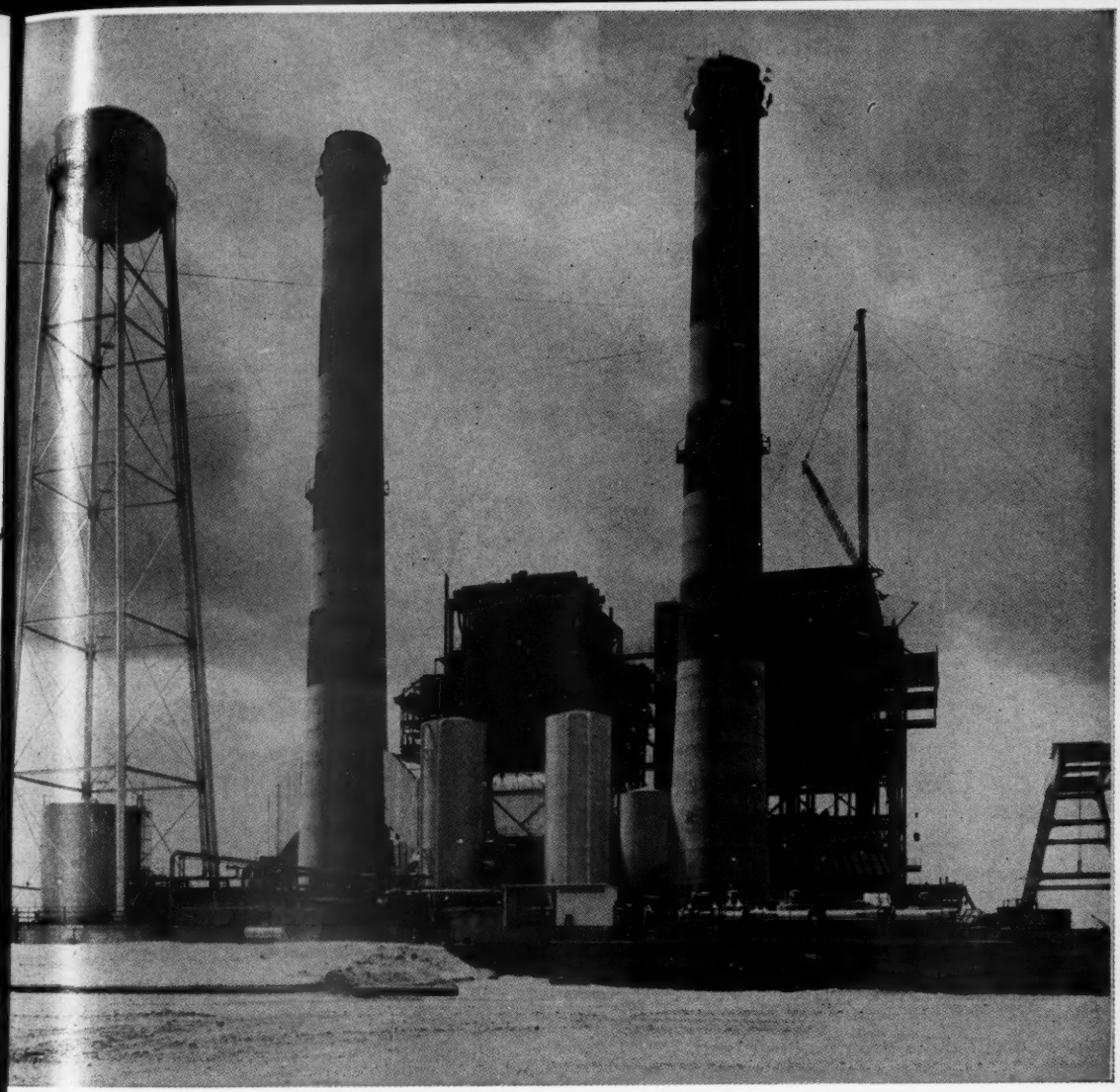


The C-E unit shown above—one of two duplicates—is now in service at the Port Everglades Power Plant of Florida Power & Light Company. Each of these units is designed to serve a 240,000-kw turbine-generator operating at a throttle pressure of 2000 psi with a primary steam temperature of 1005 F, reheated to 1005 F. They are of the controlled-circulation, radiant reheat type with divided furnaces. The reheater surface is located between the finishing superheater and the primary superheater surface in the rear pass. Economizer surface is below the primary superheater and regenerative air heaters follow the economizer. The units are oil fired using C-E Horizontal Type R Burners.



With the recent starting-up of the first unit in their new Port Everglades Power Plant, Florida Power & Light Company has made a noteworthy addition to their rapidly expanding power system. The new unit, one of two duplicates, is rated at a capacity of 240,000 kw, making it the largest in the state.

The new plant is strategically located where the robust growth of Florida's Lower East Coast pointed up the need for additional power. The availability of unlimited water supply and accessibility to tanker supply of fuel oil made Port Everglades a natural choice. The Bechtel Corporation is the consulting engineer.

The addition of these units at Port Everglades will bring the total generating capability of the Florida Power & Light system to 2,128,000 kilowatts, a fantastic increase of 380% since 1949. Such has been the demand of Florida's phenomenal growth.

Steam for the new turbine-generator now in service, as well as its duplicate now under construction, is supplied by C-E Controlled Circulation Boilers, a cross-sectional elevation and brief description of which appear on the opposite page.

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Utilities Events Calendar

CHECK THESE DATES:

Sept. 1-2—Southeastern Electric Exchange, Personnel Administration Section, will hold meeting, Roanoke, Va.

Sept. 7-8—Edison Electric Institute, Street and Highway Lighting Committee, will hold meeting, Salem, Mass.

Sept. 7-8—Tennessee Telephone Association will hold annual convention, Nashville, Tenn.

Sept. 7-9—American Water Works Association, South Dakota Section, will hold annual meeting, Watertown, S. D.

Sept. 7-9—Association of Illinois Electric Cooperatives will hold annual meeting, Springfield, Ill.

Sept. 7-9—Joint Automatic Control Conference will be held, Massachusetts Institute of Technology, Cambridge, Mass.

Sept. 7-9—Northwest Electric Light & Power Association will hold annual meeting, Glacier, Mont.

Sept. 7-10—Rocky Mountain Electrical League will hold annual fall conference, Denver, Colo.

Sept. 9-10—Maryland-District of Columbia Utilities Association will hold annual fall conference, Virginia Beach, Va.

Sept. 10-11—American Society of Mechanical Engineers will hold international air pollution congress, New York, N. Y.

Sept. 10-18—Electrical Living Show will be held, New York Coliseum, New York, N. Y.

Sept. 11-16—Illuminating Engineering Society will hold national technical conference, Pittsburgh, Pa.

Sept. 12-13—Arkansas Telephone Association will hold annual convention, Hot Springs, Ark.

Sept. 12-13—Edison Electric Institute, Residential Lighting Promotion Committee, will hold meeting, Cleveland, Ohio.

Sept. 12-13—Michigan Telephone Association will hold annual convention, Mackinac Island, Mich.

Sept. 12-13—New England Gas Association will hold gas utility managers conference, Wianno Club, Mass.

Sept. 12-14—American Gas Association will hold accident prevention conference, Minneapolis, Minn.

Sept. 12-14—American Water Works Association, Kentucky-Tennessee Section, will hold annual meeting, Knoxville, Tenn.

Sept. 13-15—American Society of Agricultural Engineers will hold farmstead engineering conference, University of Illinois, Urbana, Ill.

Sept. 14—Public Information Program, Steering Committee, will hold meeting, Tarrytown, N. Y.

Sept. 14-15—Joint Military-Industrial Electronic Test Equipment Symposium will be held, Chicago, Ill.

Sept. 14-15—Northwest Public Power Association, Accounting Section, will hold annual meeting, Wenatchee, Wash.

Sept. 14-16—American Gas Association, Operating Section, Committee on Underground Storage, will hold meeting, Buffalo, N. Y.

Sept. 14-16—American Water Works Association, New York Section, will hold annual meeting, Upper Saranac Lake, N. Y.

Sept. 14-16—American Water Works Association, Virginia Section, will hold annual meeting, Virginia Beach, Va.

Sept. 14-16—Rocky Mountain Telephone Association will hold annual convention, Denver, Colo.

Sept. 15-16—American Gas Association will hold textile processing symposium, Greensboro, N. C.

Sept. 15-16—American Gas Association-Edison Electric Institute will hold joint accounting division and section organization meetings, Pittsburgh, Pa.

Sept. 15-16—American Society of Mechanical Engineers will hold engineering management conference, Chicago, Ill.

Sept. 15-17—Municipal Electric Utilities Association of New York State will hold annual conference, Lake Placid, N. Y.

Sept. 15-17—Public Utilities Advertising Association, Region 5, will hold annual meeting, Tampa, Fla.

Sept. 15-17—Public Utilities Association of the Virginias will hold annual meeting, White Sulphur Springs, W. Va.

Courtesy, National Aeronautics and Space Administration

The Echo Satellite before Launching at Canaveral

Close-up view of the Douglas-built Delta third-stage and 100-foot "Echo" sphere container. The inflatable plastic balloon was folded inside. Weight of the balloon was about 166 pounds at launching. Sphere inflation took place at an altitude of about 1,000 miles. The two halves of the container were separated by means of an explosive charge placed around the equator of the payload container. *(See page 319.)*

Public Utilities
FORTNIGHTLY

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Can Regulators Be Judges?

By LOUIS J. HECTOR*

A number of regulatory commissions, as well as utility industry readers, may disagree, but this author sincerely believes that regulation could well be handled by a department of the government responsible to the President, just as the Departments of Agriculture and Defense are handled. The highly complex or judicial aspects, he thinks, could be given to a special court to decide. Is it possible to separate successfully policy making and adjudication? Such a system has worked for federal tax cases with its division of duties between the Internal Revenue Service and the Tax Court. Should this system be extended to regulation?

In the early days of regulation, most of the effort was spent in hammering out the basic principles of government control of business in the public interest, first in the legislatures of the nation and in Congress, and then in the various regulatory agencies and the courts. By contrast, our problems today are chiefly procedural. There are not so many arguments now over *what* regulators are doing as over *how* regulators are doing it.

At least this is the case in the federal government. And the state regulatory agencies, it seems to me, must always keep a weather eye out for developments in Washington. While the concept of the multimember, quasi-judicial regulatory agency as we know it today originated in the states, with the creation of the Interstate Commerce Commission in 1887, the scene shifted to Washington, and the major battles over the powers, structure, and procedures of regulatory bodies have since been fought out there.

*Former member, Civil Aeronautics Board, now resident in Miami, Florida. For additional personal note, see "Pages with the Editors."

THIS in no way minimizes the importance of the state agencies, of course. While each of the federal agencies is great in scope and power, they are few in number; and the sum total of regulatory actions taken by state agencies is of just as great impact on our economic and social life as that of the agencies in Washington. Indeed, some state agencies, such as the Superintendent of Insurance in the state of New York, exercise power quite comparable in every respect to that of a major federal regulatory body.

But the chief battles over the basic principles, both procedural and substantive, are being fought out today at the national level. For the past four years, the agencies have been under constant inquiry in Washington. The state agencies have so far avoided much of the heat of these controversies and have been left free to continue discharging their duties under their accustomed procedures.

The developments in Washington, however, should be of interest. For whatever the outcome, there will almost certainly be substantial changes of some sort in federal regulatory organization and procedure; and these changes in the long run will inevitably find their way into proposals for changes in our state regulatory agencies.

Conflicting Regulatory Opinions

THERE are almost as many different views on the debate over the regulatory agencies in Washington today as there are debaters. While this is confusing, it is probably healthy. It means that there is an active, probing search for the root causes of our present problems, and a far-ranging consideration of alternative solutions. There are many ways of looking at these matters, and each of them may give us some new insight or some valuable suggestion for improvement. The only participants I am suspicious of are those who say either, "Everything is going along just fine and there is no need to change anything," or those who say, "I know exactly what the problem is and I have the solution for it right here."

If we can be sure of anything about the federal regulatory agencies today, it is that they have very serious problems indeed and that no one as yet has the complete solution to these problems.

WHEN I first went to Washington to serve on the Civil Aeronautics Board about three years ago, my friends made two quite different and contradictory predictions:

First, my business friends said, "You will be appalled by the inefficiency of the regulatory processes—the endless delays, the mountainous records, the retrial of cases all over again by the agency after the examiner has made his decision, the endless oral arguments which add little to the agency's knowledge of the case, and, finally, the end result of all this time-consuming procedure—the prolongation of cases so long that many cases are decided on a record long out of date, and the agencies have no way to cope with a real emergency." They told me of one case—the General Passenger Fare Investigation—which had been started the year before, in 1956. "It will be *two* years before a decision comes down in that case," they said, "and this is intolerable. The airlines are going into a period of financial crisis. They will be in serious trouble if

a decision, and an increase in rates, is not granted immediately."

THEY were wrong in their estimate. It is now 1960—four years later—and the decision has just come down. And, as predicted, the airlines have had serious financial problems. Now I personally do not think that these problems are as much the result of the board's failure to come down with a decision in this case, as they are the result of the jet conversion and all the financial disruption that has entailed, but the delay has made of the board a useful scapegoat, and the board has been widely criticized as the source of the industry's present troubles.

Certainly, the delay has not increased the agency's stature; nor to my mind will it produce any greater wisdom in the final outcome of the case. I think those are right who say that such a delay is intolerable.

SUCH a delay as this must have a reasonable cause. Certainly the members of the agencies, as I came to know them, are responsible, conscientious men who work hard to get a job done—and done with efficiency and dispatch. The answer is then, one naturally assumes, that the agencies have become so careful in their efforts to give a full hearing of a truly judicial character to every litigant before them that their procedures have stretched to inordinate lengths. The strenuous efforts of the American Bar Association and others in recent years to judicialize agency proceedings must have finally taken hold, perhaps too much so, with the result that procedural formalities have been stretched beyond practical bounds.

BUT the second prediction I heard before I went to Washington seemed to belie this explanation. My lawyer friends, far from being satisfied with the procedural improvements accomplished by the ABA and various individual agency reforms, were, in the late fifties, crying perhaps more loudly than ever, that the agencies did not give a true judicial hearing to litigants before them nor respect the basic elements of due process.

Ex parte presentations of fact and argument and excessive entertainment were far too frequent, they said; and, in the several years since, such charges have grown ever louder and have been followed by investigations which have not added luster to the reputation of the regulatory profession.

Deficiencies in Making Decisions

BUT this is just a small part of the picture. The complaints of the lawyers have been far broader than merely of ex parte presentations or matters of pro-

priety. The records in cases before the agencies, it is said, are never even skimmed through, much less read, by those who make the ultimate decisions.

THE only person who really has any idea of the facts in all their complexity and diversity is the hearing examiner, but his decision is seldom final; it is almost always appealed to the commission itself. There, briefs are filed and oral argument is held, and this is about all the members of the agency ever know about the case. Yet they feel perfectly free to overturn the findings of the examiner and reach their own conclusions.

And after they have done so, even then they do not take the trouble to go to the record and dig out the facts to support their conclusions. This job is turned over to a professional opinion-writing staff which takes the conclusion of the agency members and then works backwards to construct an opinion to support it. If there are dissenters on the commission, the same group may write the dissenting opinion as well. This, the lawyers of the nation continue to maintain, is not a true judicial hearing, despite all the panoply of judicial trappings and procedures with which it may be surrounded.

Agency proceedings must be made truly judicial, the bar in general feels; and there are just as many proposals and drafts of new legislation to achieve this goal floating around now as there ever were.

Suggestions for Improvement

THERE are countless detailed proposals and gimmicks offered as a cure for these problems: longer terms for commissioners to give them greater security; shorter terms for commissioners so they will not become too industry-minded; lifetime pensions for commissioners so they will not worry about their future; greater respect and stature for the hearing examiners and their opinions; complete court review of both the law and the facts in every case; compulsory opinion writing by agency heads; bigger staffs; and then the perennial suggestion when you cannot think of anything else to suggest—a massive study of the whole problem that will take several years to complete.

I DO not belittle all these suggestions; I have my own pet ideas—compulsory commissioner opinion writing, for instance. But the important thing here is not any one specific suggestion, but rather the general state of dissatisfaction and the general conviction that some profound changes must be made to provide more truly judicial proceedings.

When you hear such diametrically opposed criticism, you naturally think that one set of critics must be wrong; either the agencies are neglecting due process in their drive for efficiency, or they are paying so much attention to procedural due process that they are achieving this at the expense of getting the job done. The appalling fact is that both sets of critics are right.

Judicial Treatment Has Limitations

I HAVE pondered this paradox for a long time, and I am by no means sure I have any real answer to it. But I think that this is at least part of the reason. When you try to answer *every* question that comes before you by a full judicial hearing, you end up by giving none of the

questions that come before you a full judicial hearing.

It is like a man in public office who tries to please everybody by agreeing with everybody on everything. He usually ends up pleasing nobody.

So it is with judicial procedure and the conduct of regulatory agencies. Life is not nearly long enough; we cannot afford staffs anywhere big enough; and, in any event, even if we could, the stream of our economy will not stand still long enough to give every person with any remote interest in every question, no matter how small, that comes before every regulatory agency, a full judicial hearing. It just cannot be done; and if the critics of the agencies would all stop and think for just a minute, they would realize that it cannot be done. Most of the day-by-day business of regulation must be handled on an ordinary, administrative basis like the rest of the business of government. If we try to handle every matter that comes before an agency with a full-scale trial, we will only succeed in setting up a lot of mock-judicial procedures which will not really give a judicial hearing but which *will* succeed in impeding and slowing the work of the agency.

The regulatory agencies have been guilty in a sense of appeasing the lawyers. And like everyone who tries to silence his critics by appeasement, the agencies have ended up weaker, with their critics far from satisfied and indeed making more drastic demands than ever.

The regulatory agencies must never give way on the practical fact that the great bulk of their work must be handled on an informal, administrative basis. The bar must be made to see that the effort to judicialize everything in regulation is doomed to double failure—the failure not only to achieve the goal of true judicial procedures, but the added failure of not getting the regulatory job done effectively.

Single Administrator the Answer?

And here let me say a parenthetical word about the multimember agency. The concept is clearly on the defensive. It is felt increasingly in some quarters that a single administrator, like the Fed-

eral Aviation Administrator reporting directly to the President, can do a better job than an independent, bipartisan, multimember commission. This is a trend of which all those who believe in regulation by commission should be aware.

But of course transferring everything to a single administrator does not answer the due process problem. While it might get the job done more efficiently, it would raise greater cries than ever from the bar.

And these cries cannot be dismissed or stilled. The bar is right; we do not have enough judicial procedure in our agencies. We cannot proceed much longer with a system where the ultimate deciders of critical cases never really see the record. It is wrong to decide cases involving very substantial private rights on the basis of an oral argument and a casual glance through a brief. And certainly responsible government demands that those who make important decisions take a major responsibility for stating the reasons underlying their decisions. These are only *some* of the procedural problems, on which there will be ever-increasing pressure from the bar.

As a practical matter there seems to be no way to satisfy these criticisms. Certainly the members of the average regulatory agency cannot take much more time from the endless stream of detail flowing across their desks to read records and briefs and write opinions. There is not time enough now even to look at all the documents bearing on the work of the agency, much less study, analyze, digest, and ponder them the way a judge studies the documents in a case. And the demands on the agencies and the time of the commissioners are growing greater every day.

It is quite clear, for instance, that the government agencies regulating transportation are facing new problems of competition and co-operation among various modes of transportation far more complex than we have ever faced before; these problems cannot be brushed off any longer by resort to the old formula of recognizing and preserving to each mode of transportation its inherent advantages. Some general transportation policy is clearly required and this will mean further demands on the agencies. Or look at just one agency—the Civil Aeronautics Board—and the problems of just one industry—the airlines. The transition from piston planes to jets has already caused serious dislocations within the industry.

Now we face the SST, the supersonic transport. For reasons of national prestige we cannot lag behind. The board has recognized this and has urged Congress to assist in the development of the new planes. And yet we all know the resulting economic impact on the industry could be disastrous. The agencies must squarely face such problems and solve them. They cannot undertake more detailed work; they must get rid of detail. They cannot read more records and briefs; they must read less about specific cases and spend more time on the broad problems of the future. And if these broad problems are to be solved, they must be approached with less formality, not more.

The paradox is critical and deep-rooted. Everything which increased judicial process seems to demand flies squarely in the face of the practical necessities of getting the job done.

Is There a Solution?

WHAT is the way out of this dilemma? What is the answer? If there has been any measure of general agreement in what I have stated thus far, it is here that all semblance of agreement ceases. I have discussed these problems with many devoted, intelligent civil servants and government officials, college professors and scholars, and private citizens. I think it fair to say that they all agree there are serious problems with the regulatory agencies and that we cannot duck those problems. There is further a large measure of agreement on the nature of the problems.

But when it comes to specific solutions, it seems to me that we are sharply divided into two groups—those who would make extensive procedural changes in the agencies as they are today, but leave unchanged their basic character as multimember, bipartisan, independent quasi-judicial agencies; and those who would do away with the agencies in their present form and substitute quite a different scheme of regulation. In short, those who believe that regulators can be judges, and those who feel that the effort of the regulators to become judges involves them in an insoluble dilemma. I should say right off that I belong to the second group.[1]

[1] Some experienced regulators, such as Anthony Arpaia, Alan Boyd, and Earl Kintner, with whom I have discussed these matters, disagree with me. And their disagreement is not just a belief that we should retain the status quo. If I may presume to characterize the position as I understand it, it is that the wisdom, and checks and balances derived from a multimember group are too valuable to give up; that basic economic regulation must be conducted by an agency independent of the President; and that policy making cannot be separated from adjudication. This is the classic position in support of the independent regulatory agency.

Why Not a Department of Regulation?

IN the first place, I cannot see any more reason for having transportation policy, or communications policy, or power policy independent of the President than I can see for making agriculture, or public roads, or irrigation, or national defense, or the post office, independent of the President. The people elect the President; and Congress by legislation gives him the general programs and policies to carry out and the necessary powers to do so.

What is so peculiar about the airlines or television that makes it necessary to isolate them from the general course of executive conduct? There is more money spent in subsidies and there are determinations affecting private rights involving more money made by the Department of Agriculture than in most of the regulatory agencies all put together. But we do not think that Agriculture must be independent. A decision by the Department of Defense to discontinue one type of missile and build another can affect the companies involved and the cities where the missiles are built far more than putting an air route into the city or taking one out. Yet no one proposes that we make the determination of our missile systems inde-

pendent of the President. In fact, the greatest criticism heard today is that the President is not sufficiently active in the missile field, not that he should keep his hands off of it.

In short, I would give these responsibilities to a single administrator reporting to the President, or to an officer of the Cabinet, and let him do the job just as other governmental jobs are done by the executive. It is as simple as that. I think that it is actually the result of a series of historical accidents that they are not handled that way today.

If you once accept this program, the details, I am convinced, fall into place quite easily. If you do not, of course, the difficulties are insuperable.

Some Problems

But the difficulties all boil down to two: First, that certain cases are so critical, so sharply contested, so productive of particularized, intensive pressure that the executive cannot handle them; they must be put in an independent, multimember agency to avoid intolerable pressures. Now this may be true in certain very critical, sensitive areas, but I think this is greatly exaggerated. The executive makes hard choices involving substantial private interests every day and seems to do a tolerably good job. I cannot see, for instance, that the selection of TV stations or airlines has been handled any better than the location of public highways, the allocation of federal funds for airports, or the selection of missile systems.

If Congress and public opinion insist, however, as they very well may, such questions can be given to a special court —free from details, free from policy-making responsibilities, free from routine administration; free from day-by-day contact with the industry. In short, free to do a true judicial job on the basis of policies and regulations established by the executive.

Separate Policy Makers and Judges

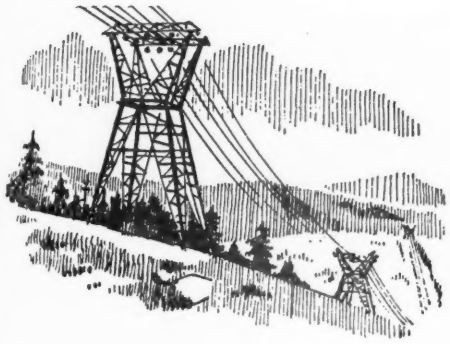
It is now argued, however, in opposition that you cannot separate policy making and adjudication. I think the answer is that you clearly can. The splendid system evolved for our federal tax cases, with its division of labor between the Internal Revenue Service and the Tax Court, prove that it can be done. The question is, rather, why not extend this system which works so well to other areas of government?

But my particular solution is not important. The important thing is to appreciate the nature and the urgency of the problems.

The job of government regulation of our economy today is critical to the preservation of our economic health and thereby of our freedom. We cannot entrust this job to procedures which do not work.

Federal and state commissioners alike must not become bogged down in a mere defense of the status quo. With their wealth of experience, they have a valuable contribution to make in the present critical review of the regulatory agencies and their procedures.

Liberal Line Extension Policies Can Be Profitable



By G. C. DELVAILLE* and ARTHUR D. BALDWIN*

A case study of one utility resulted in some interesting figures on line extensions which merit consideration. Some slightly different results and conclusions might obtain for other utilities. However, it would seem that a low return on "lean" electric line extensions to new customers need not depress the total system return.

THE world may or may not be faced with the problem of an exploding population, but here in the United States most utilities have to cope with the problem of bursting at the seams. By that we mean that ever since the end of World War II most utilities have had to expand their distribution facilities into hitherto unserved areas at an ever-increasing clip. This has been especially true of utilities whose service areas are bounded by thinly populated rural territory. Suburbia and exurbia, as well as many industries, are invading these thinly populated areas, with corresponding expansions of distribution system into these territories. Not only that, but as suburbia expands, increased demands for service into the remaining rural territory have to be satisfied.

Under these conditions, the effect of this rapid expansion of a distribution system may or may not affect a utility's overall rate of return. This is especially true of utilities where the extension of distribution facilities has to be made under rules on file with state regulatory commissions. These rules, in most instances, are based on principles promulgated long before the present rapid expansion took place. Under these conditions, it pays to reappraise the operation of these rules.

MORE specifically, a utility must obtain answers to some of the following questions:

(a) How does the annual rate of return earned on all the new business combined compare with that earned by the utility on all of its operations?

(b) What is the annual rate of return earned on various classes of new business, such as new business requiring long extensions, new business re-

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quiring advances in aid of construction from the prospective customer, and new business consisting of extensions built to serve subdivisions?

(c) Can the returns earned on various classes of new business be modified to any degree by changes in the extension rule?

(d) Would changes in the rate of return earned on various classes of new business have any appreciable effect on the overall rate of return earned by the utility?

(e) Would a more restrictive extension rule stifle the growth of the utility and hence adversely affect not only the utility but also the economic welfare of the territory it serves and eventually that of its customers?

(f) Can a utility's customer density (measured in terms of customers per mile of distribution line) be affected to any degree by modifications of its extension rule?

ANSWERS to these questions are especially needed where the utility's extension rule is based on average conditions and only indirectly related to actual construction cost and to the revenue derived from new business. This is especially true in California, where electric utilities extend their lines under a filed rule known as the "footage rule." An abbreviated sample of such a rule is shown below.

The rule also contains, among other things, certain provisions for the refund of advances.

OBVIOUSLY, such a rule will continue to operate properly only in so far as the conditions which form the basis for its design continue to prevail. Thus, if distribution line construction costs increase, the amount of advance for lines in excess of the free footage becomes inadequate and the free length allowance becomes greater than justifiable. This will result in a decrease in the return derived from new business. The same thing will happen if the general composition of the new business connected during a given period differs greatly from that which formed the basis under which the rule was established. Such a rule is established in the expectation that during a given period (usually one year), the utility will connect new business composed of specific amounts of each class of business (domestic, commercial, etc.).

Furthermore, it is also expected that a specific portion of this new business will be added on lines of length within the free footage allowed under the rule, while

The company will construct, without cost to applicants, except as hereinafter provided, the following lengths of line of 12 kilovolts or less:

(a) Permanent Domestic Service

	Free Lengths
For each lighting applicant	175 feet
For each refrigerator installation	210 feet
For each electric range, 6 kilowatts or more	500 feet
For each automatic electric storage-type water heater, per kilowatt	100 feet

Extension of lines of lengths greater than specified above, will be constructed, owned, and maintained by the company, provided the applicant or applicants for service deposit with the company in advance of construction 40 cents for each foot of line extension in excess of the free extension lengths specified above.

another specific portion will be added on lines in excess of the free footage and hence requiring advances. If there are serious actual deviations from the original composition of new business, either as to proportion of various lengths of line extension or proportion of each class of business upon which the rule was established, then the actual return earned from new business will not be that which was anticipated. Hence, it is evident that a company extending its distribution lines under this type of extension rule should periodically reappraise its operation.

What One Utility Learned

ONE utility operating under a so-called "footage rule" did make such a check. The check was made after the rule had been in operation for twelve years. It consisted of determining the rate of return earned during a recent twelve months' period for various types of new business. (See table below.)

While categories 1 through 5 in the table below are self-explanatory, category No. 6 needs further explanation. It covers new business added by existing customers, which new business did not come to the attention of the utility because the customers were able to receive service for this new business over existing facilities. Of course, eventually this type of new business, together with other types of new business, makes it necessary to reinforce existing distribution facilities by means of raising distribution voltage, increasing conductor size, increasing the size and number or transformers, etc. This type of increase in plant is duly reflected in all of the returns.

BEFORE discussing the results, an explanation of the method used in arriving at them may be of interest. The dollars of plant in service, number of customers' kilowatt-hour consumption and revenue used in determining the returns of categories 1 through 5, were assigned directly to these categories. This was possible because the utility keeps rather detailed records of all work orders covering all new business additions except in the case of category 6. Where possible, actual values of plant, number of customers, etc., were used. However, kilowatt-hour consumption and revenue had to be calculated by using the appliance and equipment additions shown in the work order records and multiplying these by known system-wide average kilowatt-hour consumption and revenue.

Beside the new business connected during any given period by means of additional facilities as described here, there was also new business connected by exist-

Category of New Business	*Per Cent Rate of Return*
1. Extension requiring advances in aid of construction	(2.59)
2. Long-line extensions not requiring advances	4.42
3. Short-line extensions not requiring advances	2.53
4. Extensions into subdivision (high-density extensions)	5.14
5. New business connected by installation of service drops and meters, and, in certain cases, transformers	13.47
6. Load added by existing customers which did not require the immediate installation of additional service facilities	7.46
7. Rate of return earned on all new business	6.11
8. Rate of return on total operations	6.06

ing customers (category 6) which, as has been stated, required no additional facilities and therefore of which the utility was unaware except as it reflected itself in an increase in sales.

It became obvious at this point that the analysis of category 6 must be approached from both ends. That is to say, an analysis of the business increases, as recorded in the books, must be made on one end of the study while at the other end an analysis of the work orders, which installed the new business in each category of new business, must be made to show how the various categories of new business participate in the overall increases. This is doubly true because a large amount of business increase is the addition of electric equipment by existing customers, which additions do not require changes in plant facilities and, hence, do not require a work order. The only way to calculate this business increase is to subtract the business added on work orders from the total business increase. The quantity of business resulting from this calculation is referred to in this study as the business category of *"others."* This method of calculation automatically assigned capital expenditures to the category of "others" which are definitely related to this category as well as the capital expenditure for various reinforcements and improvements which are *not* definitely related to service for a given category of new business. These latter expenditures were spread to the various categories on an annual kilowatt-hour sales basis.

Annual operating expense and ad valorem taxes were spread to the various categories by one or more allocation factor in accordance with the natural relationship.

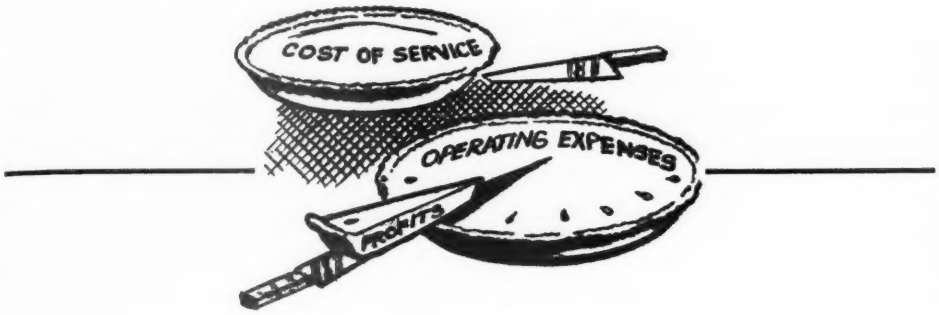
For example, customer accounting and collecting expense was spread on the basis of number of customers with an additional adjustment for customer density.

After all of the above assignments and allocations were performed, the return for each category of new business and for the total operation were calculated, with income taxes calculated to fit the net income available. From this the rate of return was determined.

What Rates of Return Indicate

Some very interesting conclusions can be drawn from the rates of return shown in the table. In the first place, it should be noted that the rate of return earned on the total of all new business during the period under study was higher than the rate of return earned by the utility on its entire operations during the same period.

We can therefore conclude that a utility can earn a very low return on certain categories of new business and still leave its overall return for the utility as a whole at a constant level or even at a higher level. This is because the low return on certain categories is offset by extremely high returns earned on other categories of new business as, for instance, in the case of new business requiring no extension, or of business added by existing customers. Conceivably, under certain conditions a utility could have an extension rule based on a rate of return lower than the rate of return earned on its overall operation and still not be adversely



affected returnwise by the operation of this rule.

ANOTHER conclusion which we can draw from the figures in the above table is that an extension rule can be very liberal even to a point of allowing the utility to serve new business requiring long extensions at no return or even at a loss without adversely affecting the overall return earned by the utility. Within reasonable limits, such a policy is correct because it enables the utility to keep up with the growth of its service area and this, of course, eventually redounds to the benefit of the utility as a whole and to the benefit of the area it serves since it helps it to grow and to expand its economy. If a utility has a very restrictive extension rule of policy—that is, one which requires the customer to advance a large sum of money—then the growth of the territory it serves will be impaired. Isolated customers, subdividers, and industries will not go ahead with construction because of the large deposits required to obtain electric service. This can eventually retard the economy of an entire area and, hence, adversely affect the existing customers of the utility.

Low Return New Business Can Pay Off

IT is important to note that categories of new business which may be served initially at low return (or for that matter, at an actual loss) will eventually earn a return as high and in some cases higher than the average return of the utility. This is true of many long extensions requiring deposits, long extensions requiring no deposits, or extensions having a low customer density (that is, having a small number of customers per mile per line). As the urban portion of a utility's territory creeps into the rural area, more customers come on these lines and the return derived from them increases accordingly. Not only that, but there also is an increase in the load of the customer for whom these extensions are originally built. These customers add new appliances over the years and this also operates to increase the return derived from such extensions.

Return on distribution systems is sometimes measured by the ratio of the cost of the extension to the annual revenue derived from it. Admittedly, this is a crude measure of return, but it does offer a rather accurate indication of *growth*

in return. Studies along this line made by one utility reveal the following growth in cost to annual revenue ratio on various long extensions in its rural territories. Some results of this study indicate the trend in return:

Cost to Annual Revenue Ratio When Extension Built	*Time Interval*	*Cost to Annual Revenue Ratio At End of Time Interval*
8.3 to 1	10 yrs. & 4 mos.	2 to 1
6.1 to 1	11 yrs. & 1 mo.	3.1 to 1
5.8 to 1	10 yrs. & 9 mos.	2.6 to 1

It is obvious from the above that the return on long extensions can and does improve over the years. The same thing is true of extensions to serve subdivisions. There again, over the years the customers add new loads and this improves the return derived from service to these subdivisions. Furthermore, initially not all houses built in a subdivision are sold. To sell them all takes some time, but eventually they all sell and this again results in an improvement of return.

Some Angles on Short Extensions

One rather surprising conclusion derived from this study is that short extensions do not produce a high return. These extensions are generally of less than 3-span length each. Because the length of short extensions per work order is less than the high-density long extensions, long extensions construction economies are not realized. Generally speaking, a certain amount of reconstruction is required at the take-off point of any extension. Since these work orders are small in total cost, there are strong indications that reconstruction cost makes up a larger portion of the total cost of each extension than in the case of the larger jobs, such as subdivision extensions.

Also, many of these short extensions are made in the suburbs where new business is assured in the near future. The utility often intersets poles or relocates poles on newly established property lines or makes other provisions in its effort to be prepared for this future business. Hence, the relatively high cost of these high-density extensions is to some degree attributed to future customers. While the additional cost of preparing for future business temporarily depresses return on this category, the economies of doing this work while the crews are on the job is reflected in the high return shown for connections of new business without line extensions.

Average Cost Need Not Be Extension Policy

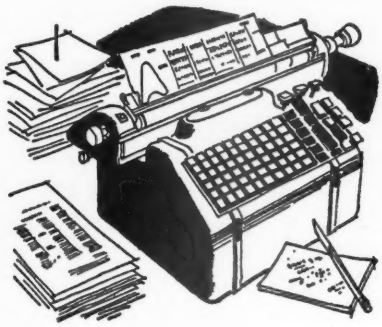
It has been held by some that an extension rule of policy should be based on the average return earned by the utility on all of its operations and that the costs on which such a rule of policy are based must be average costs. This view is held on the ground that any other basis would discriminate against existing customers. We do not believe this needs to be the case.

Existing customers cannot complain of discrimination as long as the return of the utility as a whole remains unchanged. It is true that if a utility had connected no new business whatsoever, except that added to existing customer lines by customers already served or by new customers who can be connected solely by means of service drops and meters, the rate of return of the utility as a whole might have

climbed to the point where a rate reduction would have been indicated. Such a policy would have been absurd since it would have stifled the whole economy of its territory and, therefore, worked against the interest of most existing customers.

In any event, it would be very difficult, in our opinion, to claim that an extension rule was discriminatory because certain customers connected under that rule produce less than the average return earned by the utility as a whole. In California, discrimination is covered by § 453 of the Public Utilities Code. This section reads:

> No public utility shall, as to rates, charges, service, facilities, or in any other respect, make or grant any *preference* or advantage to any corporation or person or subject any corporation or person to any prejudice or disadvantage. No public utility shall establish or maintain any *unreasonable* difference as to rates, charges, service, facilities, or in any other respect, either as between localities or as between classes of service. The commission may determine any question of fact arising under this section.



It will be noted that the question of discrimination hangs on the granting of *preference* or the maintaining of *unreasonable* differences in rates, charges, etc. Preference is defined as "the estimation of one thing or person over another" but we think that in the case of discrimination as affecting public utilities, the word "preference" cannot be disassociated from the word "unreasonable" which follows in the next sentence in the code. If it were not so, the entire rate structure and many of the practices of all regulated utilities would be illegal because it can always be shown that in the light of one yardstick or another, certain classes of customers and certain customers within a given class are preferred over other classes of customers. In our opinion, what the code is speaking about is an unreasonable preference, a preference without foundation, without reason, or, again, an unreasonably large difference.

In other words, it is not expected that every class of electric service earns the same return for the utility. Similarly, it cannot be expected that every class of new business earns the same return for the utility, and as long as the return earned for the utility by all of the new business connected taken as a group is equal or higher than the return earned by the utility as a whole, then no discrimination exists. This is particularly true where the differences in return, as among the various classes of new business, are not unreasonable differences.

Thoughts on "Footage Basis"

Of course, some instances of discrimination can creep into the design of the so-called "footage basis" extension

rule. This is particularly true in the determination of the cost per foot of line. The cost per foot of line is an important figure, not only because it enters in the calculation of the advances to be made by customers requiring lines in excess of the free lengths but because it also enters in the determination of the size of these so-called free lengths.

IT is certainly discriminatory to determine this cost per foot on the average cost per foot for distribution line for the entire distribution line construction during a given period. Generally speaking, lines involving the application of the extension rule or the collection of a deposit are constructed outside urban areas; that is, in rural territories. In rural territories, line construction is relatively cheap; long spans can be used, shorter poles are required, there are fewer angle poles, rack construction may be employed, and, generally speaking, conditions are such that lines can be put up faster than in urban areas.

THEREFORE, if in the extension rule the average cost of line per foot includes lines constructed in urban areas, the prospective customers involved in the application of the extension rule are made to pay costs higher than those actually encountered to serve them. Our own study reveals that the average cost of line constructed in rural territories is only 60 per cent of the average cost for all distribution lines. Had the extension rule been based on the average cost, there would have been collected from many prospective customers, deposits which would have been in excess of the entire cost of the line.

Some Auxiliary Results of Study

ONE interesting by-product of this study is that the returns shown in the table above are not materially affected by changes in an extension rule of policy as long as these changes are kept within realistic limits. Doubling the advance required per foot of line in excess of the free footage would have only increased the return on new business from 6.11 per cent to 6.24 per cent. This on the assumption that the customers would have still been willing to pay the increased advances. Based on an estimate of the number of prospective customers that might refuse to pay the increased advances and thus do without electric service, the rate of return derived from new business can then be again estimated and this results in a figure of 6.37 per cent.

However, the increase from 6.11 per cent to 6.37 per cent, when reflected in the operation of the utility as a whole, is watered down to such an extent that the overall rate of return earned by the utility would hardly have been affected. As against this slight increase in rate of return, we would have the fact that the development and growth of the utility would have been seriously stifled by requiring these larger line extension deposits.

ANOTHER interesting by-product of this study is the effect of a utility's extension rule of policy on its customer density. By customer density we mean the number of customers per mile of distribution line. If a utility makes its extension policy more restrictive, as long as these restrictions are kept within reasonable bounds, very little improvement

is produced thereby in the customer density. By reasonable bounds we mean such things as doubling the cost per foot of line in excess of the free footage or decreasing the free footage for various appliances by say 50 per cent; thus, increasing the advance per foot of line in excess of the free footage by 60 per cent would have caused some customers to do without electric service and fewer long lines to be built, but this would have resulted in an increase in the overall customer system density of only .076 customers per mile of line. We are thus forced to conclude that a utility's customer density is determined much more by inherent features of the territory it serves than by its extension rule of policy.

THE figures which form the basis of this article and the conclusions it contains are those derived from the operation of one utility. Other utilities might arrive at slightly different results and slightly different conclusions. Nevertheless, and in spite of the lengthy statistical work that this involves, the present rapid expansion of most utilities' distribution systems makes this type of investigation well worth while and timely.

Public Utilities Industry

"A REVIEW of the economic outlook for the public utility industry for the year 1960 . . . suggests that the predictions then made are in prospect of realization.

"An increase of about four million telephones in service during the year 1960 is still the expectation. Capital expenditures by the telephone industry are likely to be somewhat in excess of $2.8 billion.

"The increase in output by the electric utility industry to date in 1960 has been approximately 7.7 per cent over the same period of 1959, which would indicate that the annual increase may be somewhat in excess of the earlier prediction of 7 per cent. Weather conditions during the summer could have a bearing on the final result. Construction expenditures by investor-owned electric utilities will be about $3.5 billion for the year.

"The current estimate of the volume of gas sales in 1960 is about 93 billion therms, which is somewhat higher than the earlier estimate of 91 billion therms. Construction expenditures for the year will be approximately $2 billion, of which $1.2 billion will be spent in the second half of the year.

"Thus, these three segments of the public utility industry are in prospect of maintaining growth trends of the recent past, and our midyear review suggests that 1960 should be a relatively good year for each of these segments."

—ESKIL I. BJORK,
Chairman, Peoples Gas Light and Coke Company.

Nuclear Energy's Growing Pains—Practical Problems Ahead

By JOHN E. GRAY*

Some substantial programs of research and development have been carried out in the field of nuclear energy. Much progress has been made in acquiring technical data and operating know-how. But much lies ahead before nuclear generation methods become of age. Such problems as economic life of equipment, nuclear fuel and other cost factors, disposal of radioactive wastes, safety standards, and which concepts of nuclear plants to concentrate on, all must be worked out. Finally, the question must be further resolved as to exactly what rôle electric utiilties should play in developing nuclear power.

THE development of nuclear energy is something like the development of children. Like some children, nuclear energy has had a great deal of promise from the outset, with the expectation that it would, at an appropriate time, take a place of ever-increasing importance in the energy-producing community.

Now, expectations such as these are valid and vital, providing much of the impetus which is required for the accomplishment of the substantial and significant goals involved. However, expectations for both children and nuclear energy require careful development if they are to be accomplished. Also, for both, the results are a long time in becoming evident. For children the hoped-for ultimate results include maturity, industry, character, intelligence, wisdom, and wit. For nuclear energy the hoped-for ultimate results include the economic and safe utilization of nuclear fuels. For both, it takes a lot of evidence to determine that the results match the expectations, or to explain the differences.

During their developmental stage, children obviously have a long way to go be-

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fore they prove themselves as responsible adults. Nuclear energy still has a long way to go before proving itself economic. Both need freedom as well as regulation and guidance in order to develop properly. Both are in the growing pain stage with many practical problems ahead.

WHAT of the practical problems in nuclear power development?

When queried, one of my associates responded, "Money is the first, being required to solve all of the other practical problems." The Atomic Energy Commission's ten-year program and its requirement for $1.8 billion for research and development and the construction of prototype plants vividly substantiates this contention. The requirement for large sums of money for research and development indicates the existence of large problems. However, very large sums have already been spent on nuclear power development, and before looking ahead it is proper to ask, "What have we gotten for the money spent to date—or where do we stand?"

Results to Date

Two small plants have been put in operation—Vallecitos, with a rating of 5,000 electrical kilowatts, late in 1957, and Santa Susanna, with a rating of 5,000 electrical kilowatts, in mid-1957. The Saxton plant, with a rating of 5,000 electrical kilowatts, is now being constructed.

Two large plants—Shippingport and Dresden—have already been put in operation, Shippingport late in 1957 and Dresden earlier this year. Another large plant, Yankee, is now being put in operation. Several large- and medium-size plants are either nearing completion, being built, or firmly planned. These include Indian Point, Enrico Fermi, Pathfinder, Elk River, Hallam, Humboldt Bay, Peach Bottom, Parr Shoals, and Big Rock Point. The Southern California Edison Company is now negotiating the purchase of the largest nuclear power plant yet planned for this country—a 360,000 electrical kilowatt plant, as yet unnamed. Also, recently the AEC announced that a 50,000 net electrical kilowatt plant would be built in Los Angeles.

The Atomic Energy Commission, manufacturers, and the investor-owned utility companies have each contributed substantially to the technical development work underlying this entire program. The construction, operations, and fuel expense of the program are being financed predominantly by the investor-owned utility companies. Shippingport is jointly owned by the Duquesne Light Company and the AEC, who share the operations and fuel expense in accord with their contract. Cooperative or public power groups are financing the Elk River, Hallam, and Los Angeles projects. In some instances, additional assistance is provided by the AEC in the form of waiver of nuclear fuel "use charges."

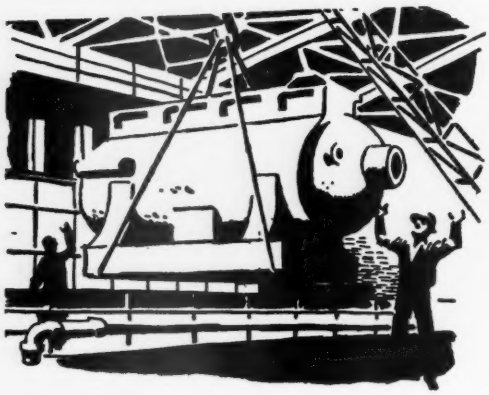
WHAT results has this very substantial program produced to date?

As you realize, a major component in computing electrical energy costs is the fixed charges on capital investment. There has been a very marked and encouraging reduction in the cost of an installed kilowatt of capacity—both actual and anticipated. The capital cost reduction trend is illustrated by figures for Shippingport of $1,250 per kilowatt; Indian Point estimated at $360 per kilowatt (for combined

nuclear and conventional); Yankee estimated at $370 per kilowatt; and Southern California Edison's 360,000-kilowatt plant, estimated at $194 per kilowatt. Of these figures, that for Shippingport can be considered firm, that for Yankee reasonably firm, and those for Indian Point and Southern California Edison's plant sufficiently good to validate the premise that capital costs per installed kilowatt of capacity are coming down to promising levels.

The sensitivity of cost per installed kilowatt figures to increased plant capacity is well known and has a most important bearing. However, increased technical sophistication, confidence based on accumulated experience, and just plain better understanding of how to design and construct nuclear power plants, have contributed significantly to the realization of the reduced costs.

A most significant result of the nuclear power plant construction program to date is the recent development of the trend toward firm price proposals for nuclear power plants at prices which may be considered attractive—their long-range economic competitiveness being a function of operation, maintenance, and fuel costs.



Some Accomplishments

WHAT other results can we identify? The two small plants already in operation—Santa Susanna and Vallecitos—have produced valuable information on the operating characteristics of sodium-cooled graphite and boiling water-type reactors, respectively. The Santa Susanna experiences included one of the most dreaded of all—nuclear fuel melt down and subsequent gross contamination of the sodium and systems in contact with it. The consequences of such a failure in a large reactor are grave in terms of damage to the fuel itself, creation of a severe maintenance problem, and a probable consequential loss of the use of the plant, which would impose economic penalties of substantial magnitude. However, since each of these two small plants has been used as a flexible development tool rather than being a prototype power station, the results can be considered useful only to a limited extent in identifying the problems, or in establishing the technical and cost factors associated with long-term operation of large nuclear power plants.

The second of the two large plants—Commonwealth Edison's Dresden station, —was put into operation in April of this year, following the correction of malfunctioning control rod drives and fuel element cladding defects found after it had been "buttoned up" in the fall of 1959. Dresden has been operated at full power for only a short time, and until it has been for a sustained period, the results of its operation will be of limited, albeit significant, value.

What Has Happened at Shippingport

Of the large plants, only Shippingport has been operated at its rated capacity for a long period of time, producing the first substantial body of empirical operating and associated technical data.

Development and design of the nuclear portion of what was to become the Shippingport atomic power station were begun in 1953. Construction began in March, 1955, and in December, 1957, the reactor first went critical, the generator was synchronized, and the station operated at full design capacity of 60,000 net electrical kilowatts.

Favorable results of Shippingport operations have included: the satisfactory performance of Shippingport as a generating plant, excellent fuel element and core performance, good operational characteristics of the reactor systems, control of personnel radiation exposures, and low amounts of radioactivity in wastes generated and ability to dispose of the wastes within permit tolerances.

Difficulties have been evidenced by the extent of the "normal" maintenance load on the nuclear systems, and the failure of three primary coolant pumps, several tubes in one of the steam generators, and the moisture separator and governor valves in the turbine. However, each of these failures has been corrected, with the exception of the "normal" maintenance load, which shows every sign of continuing at a higher than anticipated level.

The purpose of the Shippingport project has been from the outset the development of reactor technology. Long core life, reliable fuel elements, significant amounts of power from natural uranium, extensive core and plant instrumentation, permissible operation of the plant with failed elements, means of detecting failed fuel elements, and the removal of each through the pressure vessel head—all these were objectives that were established early in the project and were successfully accomplished.

As a complete power plant Shippingport has demonstrated that it has the operating characteristics necessary for it to be integrated into a large utility's generating system. The reactor has demonstrated its ability to produce at design power output on a sustained basis and to respond readily to load transients. The plant has shown itself to be suitable for operation as a base load station or a peak load station, or as a combination of both.

In the field of fuel technology, Shippingport was responsible for the development of uranium oxide as a fuel material for large power reactors. In view of its widespread application, this is a major contribution in the field of reactor fuel materials.

Shippingport was instrumental in establishing suppliers for the manufacture of primary coolant components of a size, capacity, and complexity much greater than were available at the time the project was initiated. This required that many industrial concerns build up their engineering and quality control staffs, expand their manufacturing facilities, develop new manufacturing and inspection techniques, and learn the special problems connected with the welding and fabrication of various types of stainless steels. As a result of this pioneering work, industrial suppliers are now available and have supplied primary nuclear components for water-cooled

reactors of sizes and capacity still larger than those that were built for Shippingport.

Since Shippingport was placed in operation, a planned program of operational performance testing of the plant has been followed. Verification of reactor physics calculational models, heat transfer and hydraulic calculations, demonstration of plant stability, demonstration of the response to load changes, component reliability, long-term effects such as corrosion build up and radiation level build up—all have been measured at Shippingport. In addition to technical data acquired, experience has been gained in staffing and training an organization required by an operating utility to handle maintenance, repair, and refueling operations.

I SUMMARIZE the growing pains represented by the Shippingport project as being those of any developmental project of great magnitude: the need to create the concepts, technology, methods, supply sources, trained organizations, and multitude of capacities—and still meet a schedule.

I summarize the result of the Shippingport project as the very substantial broadening of the technological and industrial base required for further advances in nuclear power. A continuing result is the outpouring of cost, operating, and test data, and experiences which only sustained use of a plant can provide and which are vitally needed for the ultimate determination of where nuclear power fits, on an economic basis.

What Is Ahead?

NOW, what of the practical problems ahead? Recall the goal—economic nuclear power. Recall also the reduced capital costs per installed kilowatt. Does this mean that capital costs are being reduced to a satisfactory level? We do not know.

Assumptions regarding the economic life of the reactor system's equipment must be verified by long-term exposure to high intensity radiation and by evidence that radioactive contamination, and subsequent maintenance difficulties, do not foreshorten the economic life of the equipment. Also, operations and maintenance and fuel costs are yet to be established on the rigorous basis of experience which

provides firm unassailable confirmation that we are dealing with known reproducible costs. Only when a lot more experience is available will we know the proper levels for capital costs (fixed charges), and for operation, maintenance, and fuel costs, in order that the sum of all of these be economically competitive. So, these items on which there is insufficient experience lead our list of practical problems.

Since the use of the atom is an activity novel and hazardous, very much government-controlled, and very important in so far as private enterprise is concerned, there are additional practical problems ahead.

HERE are some views on the practical problems ahead:

Problem Number 1—already discussed—is the determination of the economic life of nuclear power plant equipment or the substantiation of the concept that these plants and equipment can be depreciated on the same basis as conventional power generation equipment, or whatever other bases are being used in estimating equipment life.

Problem Number 2 is the determination of the cost of operation and maintenance labor and materials for typical nuclear power plants; the development of an informed understanding of what is involved in operating and maintaining these plants; and a great deal of experience in determining that a given approach to operation and maintenance is adequate from the point of view of safety as well as economy.

PROBLEM Number 3 is the determination of nuclear fuel costs. Fuel cost is the dominant factor to be controlled in the realization of our expectations for nuclear power. A great practical problem is our lack of true commercial experience in the production, utilization, and disposal of nuclear fuel. It takes a very long time to gain experience in this field. The Shippingport project was initiated in 1953. Seven years later, it is still the only project which has produced meaningful results on nuclear fuel performance under actual operating conditions for a sustained period. Generally speaking, the longer you can use a given loading of nuclear fuel, the lower the fuel cost. The life of nuclear fuels which is considered economic ranges upwards from an average exposure of 10,000 to 20,000 megawatt days per ton.

The only fuel package which has performance characteristics proven in use in a nuclear power plant, for a significantly long period of time, is that in the Shippingport station. We know from that experience that natural uranium oxide, zirconium clad fuel, fabricated in accordance with very rigorous and expensively applied standards, has sustained an average exposure of about 2,000 megawatt days per ton and a portion of the fuel a maximum exposure of about 9,000 megawatt days per ton, without any sign of deterioration. There is every indication that the natural uranium fuel in the Shippingport reactor has a much longer life—but only time will tell.

NUCLEAR fuel costs are dependent on two major factors, and a host of minor factors, which, if improperly handled, can become major. The two major factors are the cost of fabrication or preparation of nuclear fuel for use, and the duration of the use. Other factors include

use charges for the special nuclear materials, mode of operation of the nuclear fuel, credits for unused or created fissionable materials, and mode of reprocessing or disposal of the spent fuel. All of these factors represent practical problems which are a long way from being solved in a definitive, final sense.

Not until many nuclear fuel loadings have performed successfully for the very long periods of time which are theoretically associated with economic nuclear power will we know if it is realistic to expect nuclear fuels to compete. Not until many nuclear fuel packages have been skillfully operated with the requisite technical sophistication will we understand the fine points of how to extract the maximum energy from a given fuel loading. Not until many nuclear fuel loadings have been reprocessed will we have a firm understanding of the problems and costs in this critical and little explored area. Not until all of the problems of nuclear fuel supply, use, and reprocessing have been fully exposed to a free, competitive market can we expect to firmly understand the economics of nuclear fuels.

Problem Number 4 is the safe disposal of the radioactive waste products which result from the operation of nuclear power plants. Processes and methods are available which provide technically sound bases for safely handling the radioactive waste disposal problem. They must be intelligently and faithfully applied in such a manner that no overtolerance discharges result. Also, knowledge and techniques must be developed for operating nuclear power plants so as to minimize the radioactive waste disposal problem. This involves correlating fuel performance, and operating and maintenance practices, to produce a minimum of radioactive wastes which must be disposed of at the plant site, consistent with producing a maximum number of kilowatt-hours from a given fuel loading.

Problem Number 5 is assuring the acceptance of the safety of nuclear power plants. In the preceding problems, emphasis has been on learning to conduct operations so as to determine and enhance the economy of nuclear power. The economic potential is meaningless unless the operations are conducted in a manner which results in safety for both plant personnel and the public.

Of extreme importance is the development of a body of experience which demonstrates that nuclear power is regarded as safe, and welcome. Such attitudes will follow from the further demonstration that nuclear power and safety are consistent. There is no doubt in my mind that they are. There is a vast body of experience resulting from the atomic weapons production program, the naval reactors program, and the civilian power reactor program which certifies that nuclear power is safe.

Problem Number 6 is a complex of related problems. There are many different concepts as to how nuclear power should be developed. The origin of nuclear power development complicates the issue. The problem is to develop nuclear power in a manner consistent with our free enterprise system, with due recognition of the vital rôle the Atomic Energy Commission has played in furthering the use of the atom. There is the question of the future rôle of the commission, both as developer of nuclear power, and as regulator of nuclear power activities. The issue of whether the Atomic Energy Commission should be responsible for both rôles has been raised by others.

Regardless of the disposition of that problem, there remains the problem of developing a workable, well-understood, and apt body of necessary regulations which provide for the safe, further development of nuclear power. We have only begun to create such regulations, and it is obvious that a great deal of work is required in this problem area.

Rôle of Electric Utilities

Within industry there are serious problems to be faced. What specifically is the rôle of electric utility companies in developing nuclear power? Are they to make and be credited with technical contributions, in addition to financing the construction and operation of plants? Are the utility companies with nuclear plants going to be able to operate and buy fuel for them on an independent basis? Do the technically sophisticated problems involved in operating with nuclear fuel require an upgrading of technical capabilities within the utility industry? Must the manufacturers providing nuclear power plants assume a dominant rôle in operation, maintenance, refueling, and fuel reprocessing because of the technical skills required? Must a utility company look to the purveyor of a nuclear power plant for the lifetime fuel supply for that plant? Can a utility company look to other organizations, such as nuclear consultants, for unbiased, independent, expert technical advice in planning, operating, and fueling its nuclear plants?

All of these questions identify a major problem: What is a reasonable balance, and a reasonable sharing of responsibilities and rewards, among the utility companies, the manufacturers of complete reactor plants, architect engineers, independent equipment suppliers, nuclear fuel suppliers, independent consultants, and others who have a stake in the nuclear power field?

I have identified some of the more obvious practical problems ahead. Their solution will take more than the money I referred to at the outset.

My premise is that it takes a great deal of time to check out the assumptions, or expectations, made regarding the performance of any given nuclear power plant, or fuel loading. This is the source of most of the practical problems—it takes lots of practical experiences to put the problems in their proper perspective. Particularly in the investigation of nuclear fuel performance it is necessary to recognize the need for full-scale testing of given fuel concepts, and for a great deal of perspicacity and time in testing each concept. The full-scale testing can only be done in large plants, which provide not only proper exposure conditions but also

a statistical basis for determining nuclear fuel performance, and consequently cost.

THINKING of where we have been, and where we are going, I suggest that we recognize the very preliminary nature of what has been done to date. I do not discount the vast amount of developmental data which suggests that some day we shall really be in good shape, with economic nuclear power a firm reality. I do believe that we have arrived at a point where there are now available, or soon will be available, a large number of plants which can be used to explore the multitude of detailed problems, the answers to which will tell us where and when nuclear power fits into the energy production picture.

"IT is [the] seemingly ruthless aspect of competition—the pruning of the 'weak'—that makes the strongest impression on most people. For the larger part of history, and even now in many places of the world, people have viewed competition as something that may be efficient but is uncharitable, unkind, and oppressive. One of the great emotional appeals of Socialism and Communism is their promise to eliminate competition.

"An awareness of this attitude toward competition—here on a world-wide basis—is reflected in Secretary of State Herter's comments . . . on the problems of foreign trade. 'Today,' Mr. Herter said, 'we face a test no society has ever fully met: How to make competition the life, not the death, of nations.' . . .

"In short, competition serves not merely to direct people away from what they are not suited for, but also to direct their energies to what they are best fitted for. It performs a social function that could otherwise only be performed by an authoritarian power arbitrarily saying 'You do this' or 'You do that,' without regard to whether the doing fitted the doer. . . .

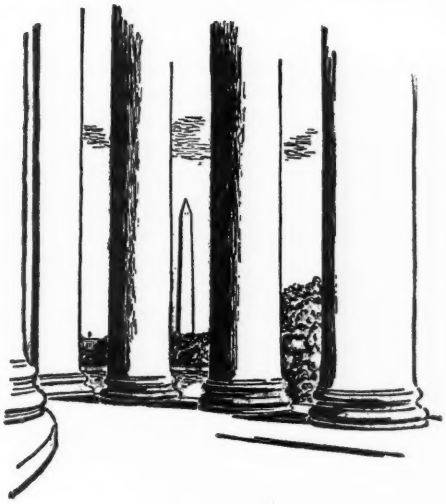
"If competition has not always been the life of nations, it is not so much because of it as for lack of it. The real difficulty is that each nation tries to do everything.

"Now we are well aware that much of this drive for self-sufficiency is political, and some of it for good political reasons. The U. S. feels, for example, that it must maintain an optical industry for defense purposes, even though Germans and Japanese can perform this function more cheaply. No nation wants to be cut off in war from a necessary item. Hence they erect all manner of barriers against 'foreign competition,' because competition would show that some of the things they are doing are not economically feasible.

"But recognizing this argument for protectionism is not the same thing as suggesting that competition itself is a thing that brings 'death' and that it somehow thus poses a great test that nations must meet to live."

—EDITORIAL STATEMENT,
The Wall Street Journal.

Washington and the Utilities



Slight Discount for the Atom

RECENTLY Great Britain cut back on her nuclear power plant program, stretching it out from ten to fifteen years. Our electric power companies in the United States have certainly not dragged their feet on their willingness to contribute. They have gone into this chiefly from a sense of public responsibility. A few nuclear plants of various forms which have materialized have shown high costs and burdensome safety requirements. And so, today, some scientists and even some utility leaders are downgrading nuclear energy.

Crawford H. Greenewalt, head of du Pont and a prime figure in the Manhattan project which led to the atomic bomb, seems to be looking instead toward the sun for safe, cheap energy sought by civilization. Pointing to the fact that fissionable materials upon which atomic energy depends are limited in supply, Greenewalt turns his attention to solar energy. "There is a real chain reaction in its output, its source so placed as to defeat lethal radiation," he said.

It is clear, of course, that nuclear energy will have many important, if not exclusive, uses for a long time to come in this world. The thrilling round-the-world feats of our nuclear submarines are clear proof of this. But there is at present a discernible discount of former rosy promises that the atom will be the world's future source of cheap power, at least from a timetable viewpoint. With a more realistic appraisal may come a more practical and worth-while approach to decisions based on what we should and should not expect of atomic power in the future and which techniques are most promising and practicable.

BOTH the United States and the Canadian governments have embarked on a long-range, co-operative program to perfect power plants using heavy water as a moderator. Heavy water has been found to be the best material for slowing neutrons in a nuclear reaction in a way that is most effective for power purposes. The two-nation program is to run for at least ten years, the Atomic Energy Commission announced, saying it has signed a memorandum of understanding with Atomic Energy of Canada, Ltd.

The commission disclosed it would

carry out $5 million worth of research and development to assist Canada in constructing two heavy water reactors. One would be a pilot plant of 20,000 kilowatts, the other a full-scale plant of 200,000 kilowatts. The United States presently has several heavy water reactor projects. One is a 17,000-kilowatt power station to be built by the Carolinas Virginia Nuclear Power Associates at Parr, South Carolina; the other a 50,000-kilowatt plant to be built by the Florida West Coast Nuclear Group and the East Central Nuclear Group near Tampa, Florida. In carrying out the co-operative program, the U. S. and Canada will exchange information, personnel, and materials. A joint board of progress is to be set up.

Canadian Import Authorized

THE FPC last month authorized the importation of more than 500 million cubic feet of natural gas per day from the Alberta reserves in Canada. The gas will eventually be delivered to markets in the Pacific Northwest states and California. The FPC action will permit three U. S. companies to import approximately 213.3 billion cubic feet of gas annually for consumption in Oregon, Washington, Idaho, and Montana, as well as California. The commission said the proposal to connect the Alberta reserves with the rapidly expanding West coast markets "is one which holds promise of great benefits to both countries."

The gas will be sold or transported from Canada by five Canadian companies, two of which are wholly owned subsidiaries of U. S. utilities. The entire international project, including facilities to be built in California, has been estimated to cost more than $400 million. The FPC said that it was not assuming that no problems would arise during the 25-year life of the program. The three U. S. companies must file annual reports showing monthly and peak-day volumes, average monthly prices, etc.

Companies authorized to import Canadian gas include the Pacific Gas Transmission Company (a proposed new interstate pipeline to San Francisco, California), El Paso Natural Gas Company of Texas, and Montana Power Company of Butte. The El Paso Company is already serving markets in the Pacific Northwest with gas imported from Canada under a 1955 authorization to Pacific Northwest Pipeline Corporation, which subsequently was merged into El Paso.

MONTANA POWER also imports smaller quantities of Canadian gas under 1952 and 1955 FPC authorizations. Pacific Gas Transmission will purchase the gas from Alberta & Southern Gas Company, Ltd., at the U. S.-Canadian border, between British Columbia and Idaho, near Kingsgate, British Columbia. Pacific Gas Transmission will then transport the gas to the California-Oregon border for delivery to Pacific Gas and Electric Company for distribution in California.

The gas initially will be purchased by Alberta & Southern from producers in Alberta fields, then transported to the Alberta-British Columbia border by Alberta Gas Trunk Line Company, Ltd. It will then be transported across British Columbia to the U. S. border by Alberta Natural Gas Company for delivery to Pacific Gas Transmission. Pacific Gas Transmission will build a 36-inch line extending 614 miles from the Kingsgate interconnection through Idaho, Washington, and Oregon, terminating on the California-Oregon border near Klamath Falls, Oregon.

Estimated cost is $133 million. PG&E will receive an average of 418 million

cubic feet daily or 152,523 million cubic feet annually. The gas for El Paso's northwest division will be purchased in Alberta by Westcoast Transmission Company, Ltd., and then transported through facilities of Alberta Gas Trunk Line and Alberta Natural to the U. S. border near Kingsgate for delivery to Pacific Gas Transmission.

All of the necessary export authorizations have been obtained from the Alberta government and the Canadian National Energy Board for the gas covered by the various proposals. In addition to the facilities of Pacific Gas Transmission and El Paso, intrastate projects will be built by PG&E, at a cost of $63,930,000, and by Montana Power, costing $2,573,000. The intrastate facilities do not require FPC certificate authorization. The other new facilities making up the interconnected international project are located in Canada.

Cuba Seizes Utility Properties

In a move that the U. S. State Department has labeled as "discriminatory" the Cuban government has expropriated $913 million of American-owned property, mainly electric and telephone plants. Among the companies whose properties were seized are the American-owned Cuban Electric Company, Cuban Telephone Company, American-owned sugar mills, and Sinclair, Esso, and Texaco oil properties. The new grabs by the pro-communist Castro government were generally anticipated ever since Cuba had announced that it had assumed the power of expropriation following cuts in the Cuban quota for sugar imported for the U. S. market. The State Department will protest the seizure on the grounds of confiscation without adequate payment, but a further showdown on this issue is not expected to be pushed at this time.

Castro had said that 2 per cent bonds, supposed to pay for the property, would have a 50-year term instead of the thirty years he originally announced. In addition the money to pay for these bonds would come from one-fourth of the value of all Cuban sugar bought by the U. S. in excess of 3 million tons per year, at a price of 5.75 cents a pound. In view of the July cuts in the sugar quota, this means U. S. investors in the seized utility property could get nothing for an indefinite period.

A move which may foreshadow additional seizures was the establishment by the Cuban government of a Mineral Institute. This action was looked upon as a prelude to the recent seizure of the $100 million U. S. government-owned Nicaro mining complex and the $75 million Moa Bay nickle and cobalt properties belonging to the American Freeport Sulphur Company. Cuba has also ratified cultural, scientific, and technical treaties with Red China, Poland, and Yugoslavia. This move, no doubt prompted by Ché Guevara and Raul Castro (chief communist spokesmen in the Cuban government), is a stepping up of anti-enterprise policy indoctrination hostile to the interests of U. S. investors.

U. S. Study of Regulatory Showdown Proposed

The General Accounting Office, in cooperation with the Senate Interstate Commerce Committee, is planning a special investigation of the delays, procedural or otherwise, which have resulted in bottlenecking the work of federal regulatory agencies. Senator Magnuson (Democrat, Washington), chairman of the Senate committee, said that his group was "very

concerned" about the regulatory lag, including the growing backlog of undecided cases which might undermine public confidence in the work of these agencies.

THE scope of the study will include regulation of railroads, airlines, natural gas, telephone, and telegraph security issue cases. It will range from rate cases to service and merger programs.

Senator Magnuson is said to feel that the oldest and largest of the federal commissions (the Interstate Commerce Commission) would be the primary objective of a "pilot" study because the ICC operates on such a broad base. It has eleven commissioners, a number of special bureaus, and utilizes various special procedures. Out of a study of these operations might come some finding or conclusions which would be applicable to the job of streamlining or "bottleneck busting" in other federal commission areas.

The General Accounting Office is supposed to kick off the study program and report back to Congress next year. Then the Senate committee's staff will draft its own recommendations for the work of the various commissions reviewed. Among these are—in addition to the ICC—the "big six": Federal Communications Commission, Federal Power Commission, Federal Trade Commission, Federal Maritime Commission, Civil Aeronautics Board, and the Securities and Exchange Commission.

The study will be distinguishable from the investigatory work heretofore carried on by the House Legislative Oversight Subcommittee in that it will deal with routine practices and procedures rather than charges of irregularities, wrongdoings, or abuses. Senator Magnuson is said to feel that the main emphasis now should be on making regulation work better, in addition to correcting shortcomings of individuals or practices already disclosed. He thinks that the problem of regulatory lag—although less sensational and dramatic than such matters as rigged quiz programs or "payola" scandals, which have occupied the headlines for the last couple of years—probably constitutes a heavier economic burden to the regulated industries and the consuming public than the occasional moral or ethical lapses of individuals or particular group or industrial abuses.

Railroad and air-line mergers will probably occupy a good bit of the attention of the Senate-sponsored investigations. For example, railroads, which have already had merger applications on file with the ICC for more than a year, figure that many thousands of dollars a day are lost in savings to the public and to investors because of the delay in clearing the track for actual consolidated operations.

Computers Exchange Information over Phone Lines

THE International Business Machines Corporation has announced a new data transmission unit that enables two separate computers to exchange information directly over the telephone while continuing to carry on individual calculations. The new equipment, known as the "1009 data transmission unit," is said to be able to exchange information at a rate of 150 numbers or symbols per second.

The units are scheduled for delivery next summer and they will be available for rental at about $500 per month. Industries with a need for centralized data processing are expected to be the heaviest users of the new equipment.

Telephone and Telegraph

U. S. Scores First Reflector Satellite

THE communications industry entered a new era when the first radio mirror satellite was put into orbit on August 12th. The huge satellite, which has been seen in the early morning and evening sky, stands some 100 feet high and is made of a plastic film coated with vapor-deposited aluminum to assure high reflectivity. With this bright coat the new satellite appears seven times brighter than the North Star.

Dr. T. Keith Glennan, director of the National Aeronautics and Space Administration, has termed the 1,000-mile equatorial orbit "well-nigh perfect." The inflated sphere makes one pass around the earth about every two hours and when it is within direct line-of-sight radio signals can be bounced from coast to coast, using the satellite as a backboard.

At 7.41 A.M. on the morning of the launching, a prerecorded message from President Eisenhower was transmitted between Goldstone, California, and Holmdel, New Jersey, using the satellite as a passive reflector. "This is President Eisenhower speaking" were the first words transmitted. The quality of the transmission was said to be amazingly good. At the time the President's voice was bounced coast to coast, the satellite was about 1,000 miles above Kansas traveling Northwest to Southeast at about 16,000 miles per hour.

Scientists have not committed themselves as to how long the satellite will remain in orbit. In all probability micrometeorites will cause some loss of gas and the reflector is expected to collapse when the path of the earth reaches such a position that the satellite will be in eclipse. There is some hope that the balloon will reinflate when the earth again moves so that the sun's rays shine once more on the man-made moon.

NOT long ago the Bell system advised the Federal Communications Commission of long-range plans for a worldwide satellite communications network. In Bell's outline to the commission both passive and active satellites were explored. Tough electronic components with long operating life are now under development. Satellites of the future may be able to receive and retransmit radio signals as well as acting as a passive reflector.

In the not too distant future it seems quite likely that transoceanic telephone calls will go via satellite. Certainly television signals which are now limited to line-of-sight transmission will be beamed

from nation to nation. This does not mean that expansion of the telephone cable networks will come to an end or that the cables will be less used. The transoceanic cables have a great advantage in that they are but little bothered by magnetic storms on the sun and they will thus continue to be the backbone of transoceanic communications long after the first satellite system is operational. No one, however, minimizes the importance of this latest U. S. space achievement.

Communications Industry Still Under Scrutiny

THE subject of "payola" and other irregular broadcasting practices in the radio and television industries continue to receive the attention of the federal commissions and Congress.

Federal Trade Commission Chairman Kintner has stated that payola "has been pretty well stamped out" as a result of a nine-month crackdown on record manufacturers and distributors. The FTC has lodged some 102 complaints and it seems to be the commission's attitude that it will now sit back and see if the industry will police itself.

Legislators, however, seem to feel that something more than this is needed. On August 19, 1959, the Senate passed a bill (S 1898) which was subsequently amended and passed by the House on June 28th of this year. The amended House version makes it a crime to accept "payola," take part in a rigged television quiz show, or engage in other deceptive practices. It would also provide the Federal Communications Commission with two new sanctions which could be leveled at stations violating FCC rules. First, a station's license could be suspended for a period of ten days. Secondly, the station could be fined $1,000 per day if it "negligently or intentionally" failed to live up to promises made in its license application or if it ignores FCC rules.

THERE is a good bit of feeling that these provisions, while well meant, tend to go too far. In a rather unusual move the Senate Commerce Subcommittee has been holding additional hearings on the House-amended bill. Normal procedure would have been for the Senate to accept the House version or to request a conference to iron out differences in the two versions of the bill.

Senator Pastore (Democrat, Rhode Island), chairman of the subcommittee, has indicated that he believes the stiff penalties in the House measure should be eased. He favors knocking out the suspension provision because he feels that more harm will be done to the viewers than to the stations. He stated that "a suspension is going to hurt the kiddies who watch Howdy Doody a lot more than the licensee . . . He might take a vacation in Bermuda."

In testimony before the subcommittee, FCC Chairman Ford endorsed the suspension provision but noted that he would rather have a bill passed without it than to have no legislation at all. This remark brought a sharp return from Senator Pastore, who stated that the subcommittee did not intend to give the impression that there was bargaining on the legislation.

Vincent Wasilewski, vice president of the National Association of Broadcasters, told the subcommittee that he felt the license suspension provision was "tantamount to economic strangulation." He noted that a station, which had its license suspended, would lose both advertisers as well as the viewing public. He stated that the FCC has the power to issue cease-and-desist orders. He indicated that this, in his opinion, was sufficient control over broadcasting infractions of commission rules.

The FCC has begun monitoring of radio and TV programs and Congress has voted an appropriation for this activity. The commission has been strong in its statements that no attempt to determine if a program is good or bad will be made and there seems to be an acute sensitivity to the dangers of any sort of censoring activity.

At this writing it seems that some changes will be made in the House-approved bill and this would once again kick it back to the lower chamber. The Representatives, in the adjournment rush, might agree to the Senate changes or a conference might be requested.

Midyear Telephone Review

THE U. S. Department of Commerce, Business and Defense Services Administration, has recently issued a report indicating that the rate of growth of the telephone installations in the nation has remained constant in the first six months of 1960. Number of phones increased more than a million and a half. If this trend continues to the end of 1960, there should be some 74 million phones in use.

The midyear report indicates that many factors, such as increases in population, new homes, and the gross national product, influence the growth of the industry. For instance, the population is increasing at a rate of one person every eleven seconds and this is bound to influence the industry over a period of time. Daily toll calls also are a barometer of general business conditions. Toll calls are now up 8 per cent over the 1959 level. In addition the telephone industry continues to expand because of the extension of telephone services, such as secretarial answering, telemetering for power stations, data processing, teletype service, leased facilities, etc.

The report indicates that the upward trend in the communications industries in the past few decades is in line with the general advances made in employment, industrial production, housing, income, and the gross national product.

An increase of 20 per cent for the first half of 1960 is anticipated in telephone installations, construction of buildings, outside plant, and sales of switching equipment. In line with this, planned expenditures are expected to be realized with an increase in local and toll call revenues. Final statistics on these matters, however, are not yet available.

New Concept in Phono Recording Forecast

A MAN, who a good many years ago pioneered the development of wire recording, has suggested that some radical changes in the recording business may be in the not too distant future.

Marvin Camras, who preserved sound on a spool of piano wire back in 1939, has stated that the music store of the future may keep in stock only one master record of each musical selection. The customer would bring in his own tape and the store would record it for him. Mr. Camras suggests that a vending machine-type operation might even be used.

At the moment by far the largest volume of the recording business goes to the long-playing phono record. Tape has always had the disadvantage of requiring threading, which the average home owner finds a bother. Mr. Camras' latest invention is a miniature tape reel that threads itself automatically when it is inserted into a recorder. If this self-threading device proves a success a large volume of the recording business might shift over to tapes. Should this occur Mr. Camras' do-it-yourself record shop may not be far off.

Financial News and Comment

By OWEN ELY

Bell System Proposes 50 Satellites for World Communications and TV

OUR communications setup is becoming very complicated. First we had ordinary wire systems for telephone and telegraph messages on land, and later cables to span the oceans. Next came underground "coaxial" land cables for concentrating the heavier business between cities, including TV relays. Talks by radiotelephone began to supplement foreign cable messages. Then the land short-wave radio system was introduced, messages being relayed by microwave from one tower to another—towers being located in line of sight, on hilltops about 30 miles apart. A new system called "Waveguide" is now under development. The Bell system has been pushing telephone cable construction to foreign countries to handle phone talks more efficiently than by radiotelephone, where weather sometimes interferes.

Now the Bell system proposes going into the stratosphere, using satellites something like Echo I just put into orbit by the government—a huge balloon about the size of a ten-story building which can be seen like the evening star. Messages have been bounced off this satellite quite successfully to span long distances. Bell contributed to the success of Echo I by developing a "command guidance" control system by which the satellite was guided from the ground into its almost circular orbit.

Now Bell has proposed to the FCC that, after further research, it be allowed to send up 50 satellites to establish a new world-wide communications system. Unlike Echo, these would not merely "bounce" the messages beamed up to them, but would amplify them before relaying them to some other continent. While these satellites would mainly handle individual telephone calls or messages, they would be specially designed for broad-band use, transmitting TV programs or computer data from one continent to another. While Dr. John R. Pierce

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of Bell Laboratories thinks that transoceanic TV may be only about two years away, it is estimated that it might take five or ten years before satellites will be carrying a large proportion of transcontinental traffic.

It had been proposed earlier that a "fixed" satellite be used for communication — by giving it speed to match the rotation of the earth it would always remain in the sky above a certain city or area. However, the Bell proposal is different—all 50 satellites would operate in random polar orbits at a height of about 3,000 miles; combined with 26 transmitter-receiver stations, working in pairs (13 in the U. S., each being tied to some foreign station). Thus there would be approximately 600 telephone circuits plus facilities for TV service between each of the 13 pairs of ground terminals. The satellites would orbit in patterns so organized that three of them would be available at any one time to service a certain land station; as one satellite began to recede, the beam could be shifted to an approaching one, so that the message or program would not be interrupted. The whole system, including the land stations, would cost about $170 million, most or all of which Bell would be prepared to assume.

FCC approval of the satellite program is necessary because one of the commission's functions is to allocate radio frequencies. The commission about a year ago opened up blocks of frequencies for general use, but with no provision for space communication; in May this year it reopened the case to consider the space issue, including the Bell proposal. The recent success of Echo I has publicized the proposal. The testimony and exhibits of American Telephone and Telegraph, "In the Matter of Allocation of Frequencies in the Bands above 890 Mc" (Docket No. 11866), give an interesting discussion of the relative advantages and disadvantages of the various types of communications facilities.

President James Fisk of the Bell Labs forecasts a tremendous increase in transoceanic messages since 94 per cent of the world's population now has only 45 per cent of the world's telephones. Overseas telephone messages are now growing at the rate of 15 per cent a year. Moreover, the new satellite system is needed for military uses and to send TV and other broad-band messages between continents. While Bell will continue to build cable lines, all the transoceanic telephone circuits now available afford only about one-quarter the band width required for one TV signal. Accordingly, Bell is asking the FCC to reserve enough frequencies in the spectrum from 1,000 Mc to 16,000 or 20,000 Mc to permit developing the satellite communications system.

Economic Depreciation and The New Tax Survey

THE Treasury Department recently began a broad survey of depreciation practices to determine whether present tax allowances for obsolescence, as well as wear and tear, are adequate. (Last December the House Ways and Means Committee had a similar investigation.) According to *The New York Times,* the administration feels that the tax laws should be more liberal in this respect in order to stimulate new investments. Vice President Nixon, as well as Governor Rockefeller, are said to have endorsed the idea.

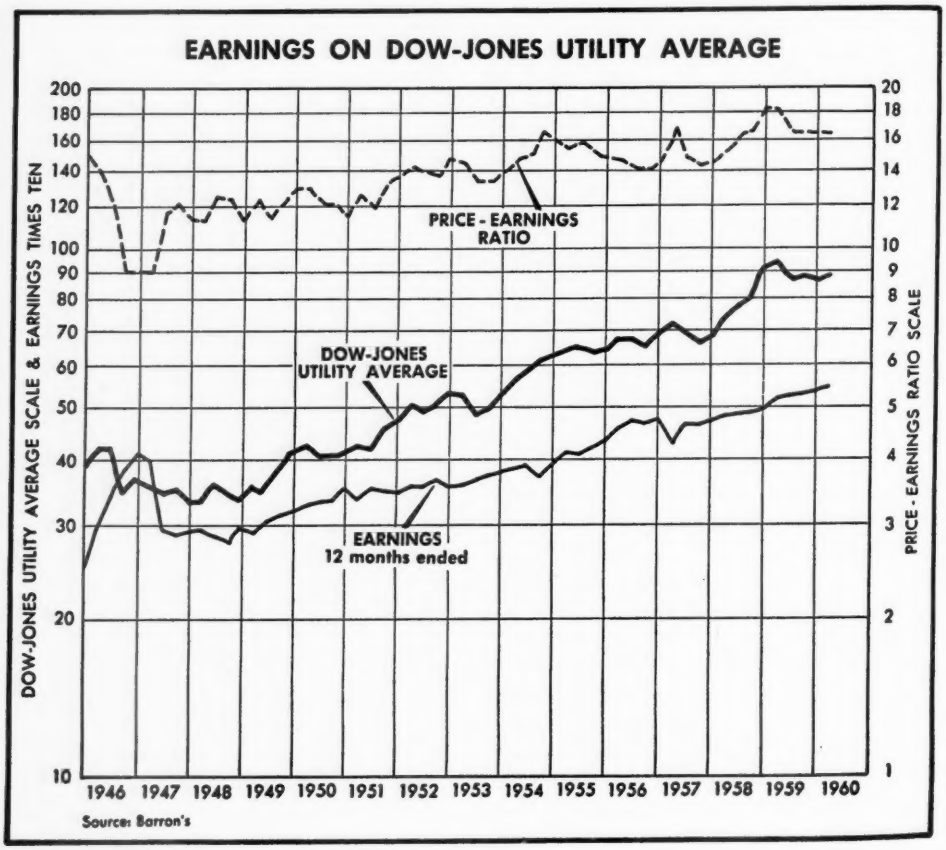
The Treasury Department and the Small Business Administration have mailed some 6,000 questionnaires to manufacturing, utility, and other corpora-

tions, to obtain statistical information from a representative group of taxpayers, to determine how well the present depreciation provisions of the tax law are operating and what legislative changes may be desirable. For example, businessmen are said to have complained that the Treasury's schedule of "useful lives," written some eighteen years ago, is now obsolete.

The survey also is intended to reveal how widely corporations are using the depreciation methods adopted in the 1954 Tax Code and whether they have encouraged investment.

BUSINESS is now reported to take about $25 billion a year in total depreciation allowances, according to *The New York Times*, and this seems to fit in well with the 1959 data contained on page 776 of the *Federal Reserve Bulletin* for July.

New plant and equipment (which presumably includes replacements) approximated $33 billion and the increase in working capital was about $10 billion, so that cash required was approximately $43 billion. Sources of this cash were the $25 billion depreciation charges, undistributed corporate profits of about $10 bil-



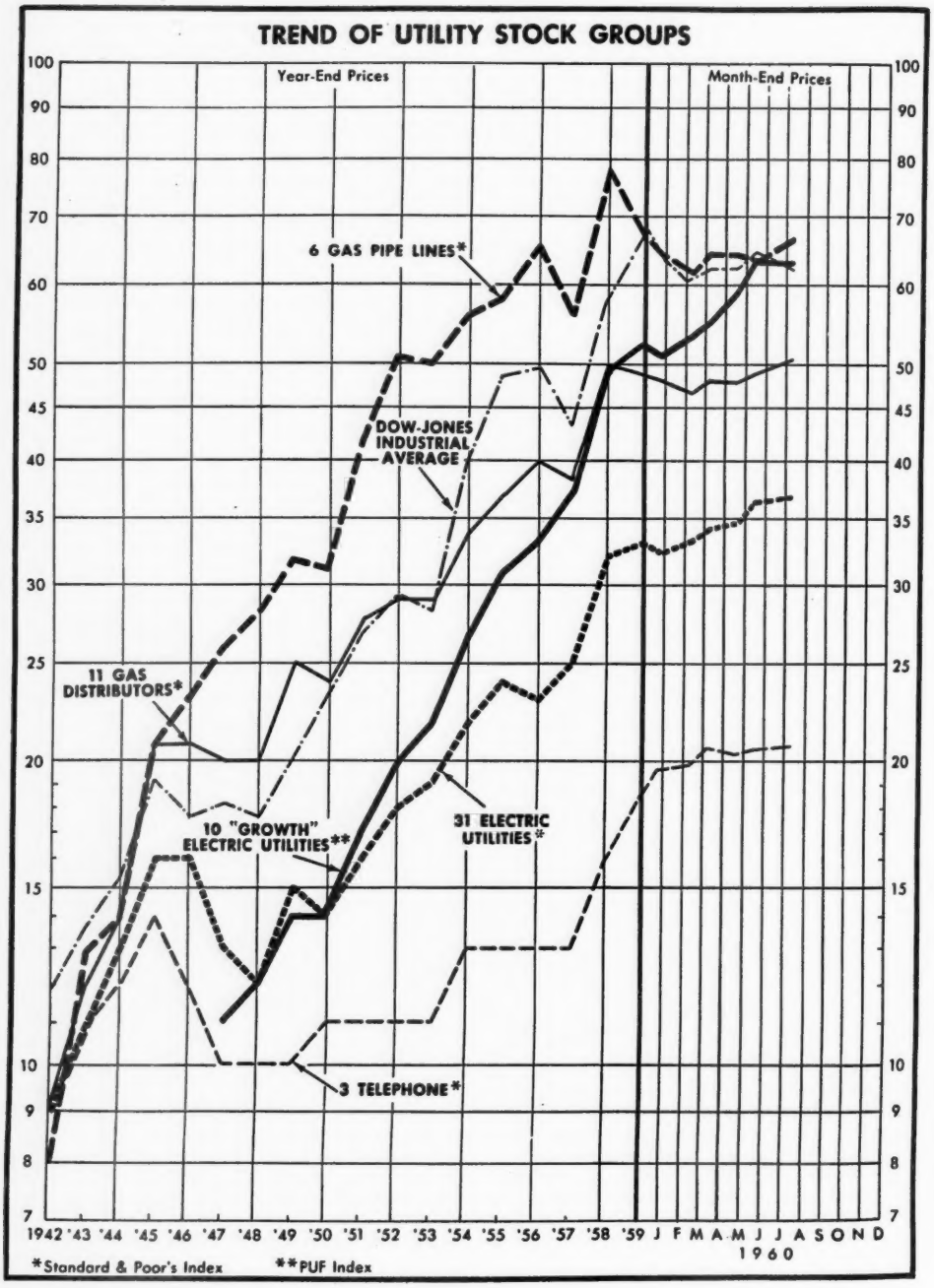
lion, and a net increase in corporate securities approximating $8 billion. But with industrial profits now being "squeezed," there may be less money in future to spend on new equipment, unless more securities are sold or depreciation

CALENDAR OF PROPOSED UTILITY OFFERINGS

August 23rd-December 31st

Date of Bidding Or Sale	*Approx. Amount (Millions)*		*Method Of Offering*	*Moody Rating**
		Bonds and Debentures		
—	$ 30	Northern Natural Gas	N	A
—	15	Idaho Power Company	—	Aa
—	30	Detroit Edison Company	—	Aa
—	35	Trunkline Gas Co.	—	—
—	30	Wisconsin Electric Power	—	Aa
—	10	New England Electric System Subsidiary	C	—
—	3	Lake Superior District Power	—	A
—	30	Pacific Lighting System	—	—
—	10	Iowa Electric Light & Power	N	—
—	6	Otter Tail Power	—	Baa
—	65	Panhandle Eastern Pipe Line	—	A
8/23	60	Southern California Edison	C	Aa
9/	25	Natural Gas Pipeline Company	N	—
9/	35	Consumers Power	C	Aaa
9/	25	Natural Gas Pipeline	N	A
9/13	25	Virginia Electric & Power	C	Aa
9/14	16	Utah Power & Light	C	A
9/20	50	Public Service Electric & Gas	C	Aa
9/21	12	Rochester Telephone	C	Aa
9/21	20	Pacific Power & Light	C	Baa
9/22	50	Union Electric	C	Aa
9/27	12	Indianapolis Power & Light	C	Aa
9/28	60	New York Telephone	C	Aaa
10/	30	Wisconsin Electric Power	C	Aa
10/4	5	Southern Nevada Power	N	Baa
10/4	30	San Diego Gas & Electric	C	Aa
10/6	30	Columbia Gas System	C	A
10/18	16	Louisville Gas & Electric	C	Aa
10/20	25	Florida Power Corp.	C	Aa
10/25	250	American Telephone & Telegraph	C	Aa
11/3	12	Georgia Power	C	A
12/	60	Consolidated Edison	—	Aa
12/	15	Arkansas Power & Light	C	A
12/6	35	Northern States Power	C	Aa
		Preferred Stock		
—	5	Hawaiian Electric	—	—
—	20	Long Island Lighting	—	—
—	20	Baltimore Gas & Electric	—	—
—	15	Texas Eastern Transmission	—	—
—	20	Pacific Lighting System	N	—
—	20	Houston Lighting & Power	C	—
9/	15	Natural Gas Pipeline Company	N	—
9/	15	Public Service of Colorado	N	—
9/14	10	Utah Power & Light	C	—
10/4	2	Southern Nevada Power	N	—
		Common Stock—Offered to Stockholders		
—	6	Hawaiian Electric	—	—
9/1	4	Atlanta Gas Light	N	—
9/21	5	Missouri Public Service	N	—
		Common Stock—Offered to Public		
—	9	Columbus & Southern Ohio Electric	—	—

*Preliminary, or rating of similar issues. C—Competitive. N—Negotiated.


TREND OF UTILITY STOCK GROUPS
Year-End Prices
Month-End Prices
6 GAS PIPE LINES*
DOW-JONES INDUSTRIAL AVERAGE
11 GAS DISTRIBUTORS*
10 "GROWTH" ELECTRIC UTILITIES**
31 ELECTRIC UTILITIES*
3 TELEPHONE*
100
90
80
70
60
50
45
40
35
30
25
20
15
10
9
8
7
1942 '43 '44 '45 '46 '47 '48 '49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 J F M A M J J A S O N D
1960
*Standard & Poor's Index
**PUF Index

charges can be increased; and if profits continue to decline, it will be harder to sell securities.

If the incoming administration wants to promote continued growth—at the 5 per cent annual rate prescribed by the Democratic platform, or at some lower rate if necessary to prevent inflation—it may be advisable to provide new corporation tax savings by some such device as "economic depreciation," in addition to those already provided by accelerated amortization (now rapidly expiring) and liberalized depreciation (not fully adopted by the utility industry).

"ECONOMIC depreciation," which has been favorably discussed by officials of such corporations as U. S. Steel and American Telephone and Telegraph, should prove both a corrective to offset past inflation, and a stimulus to increased construction through tax savings, it is claimed. At the House hearings last December William A. Paton, professor of accounting at Michigan University, stated:

> The nub of this depreciation question lies in the acute importance of maintaining plant capacity to produce throughout the economy. And this cannot be done without permitting taxpayers deductions which take into account the impact of inflation, the severe and persistent decline in the purchasing power of the dollar.

In a panel discussion of depreciation at the fifth annual convention of the Great Lakes Conference of Railroad and Utilities Commissioners in April, Dr. Paton held that utilities had been the "forgotten man," with the industrial point of view dominating the testimony before congressional committees and other government bodies — despite the fact that the utilities provide the major examples of enterprises in which depreciation is of outstanding importance as an operating cost. He said:

> The burning question with respect to depreciation measurement in recent years, as I see it, is not the problem of estimating service life, or of deciding just how to spread plant cost over an assumed life, but rather the impact of inflation, the change in the value of the dollar, the accountant's yardstick, which we have been experiencing. . . . The value of our monetary unit has fallen half way to zero in just a few years. And I don't see how we can continue much longer to try to ignore this phenomenon in the area of corporate accounting.

Two More States—Colorado And New Jersey—Go "Flow Through"

THE temptation to the state commissions to give consumers the benefit of tax savings from accelerated depreciation seems too strong for some of them to resist, and one by one they are ordering flow through in order to offset part of requested rate increases by this device. The number of electric utilities which, either voluntarily or under regulatory duress, have adopted this accounting method has increased steadily from 14 in 1956 to 24 in 1959. This year, with pressure from the California and Colorado commissions, there will doubtless be a further increase; and it appears now that New Jersey will follow suit. However, both Congress and the Treasury Department are now studying the question.

In the Public Service of Colorado decision, dated May 27th, the commission allowed an increase of about $4.4 million

compared with the $10 million requested by the company. Of the difference about $1,237,000 was accounted for by adoption of flow through. The commission reasoned as follows: With an assumed straight-line depreciation rate of 2½ per cent, property life would be forty years; with liberalized depreciation a double rate would be allowed during the approximate first twenty years and one-half of the normal rate in the second twenty years. Hence an increase in taxes would be deferred for a substantial time, and the fear that with flow through the company would have to come to the commission for higher rates within a short time is "tenuous, and of insufficient weight to compel a policy conclusion based upon such apprehension." Secondly, the savings in income taxes are expended for new plants and these amounts "are derived from rates charged to the ratepayers; therefore present ratepayers should derive the benefit therefrom."

As we go to press, the state of New Jersey has ordered Public Service Electric & Gas to use "flow through" for rate purposes; the company had asked for a $36 million increase in revenues and received about $10 million plus the benefit to earnings obtained by "flow through."

Baltimore Gas & Electric's Rate Figures Clarified

F. E. RUGEMER, treasurer of Baltimore Gas & Electric Company, writes us as follows in reference to "High Lights of Electric Utility Stockholders' Reports" in the August 4th issue:

> With reference to the statement therein that Baltimore Gas & Electric finally won approval for a "$5.4 million increase in rates," we thought we should remind you that this figure represented only part of the total rate increase. The higher rates authorized in 1958 were designed to produce for a full year nearly $9½ millions of additional revenue, and were in effect for part of 1958. In reporting the total *increase* in 1959 revenues over 1958 (which included part of the effect of the increased rates), we explained that of the $15,530,000 total increase, $5,425,000 was due to the higher rates.

FINANCIAL DATA ON ELECTRIC UTILITY STOCKS

Annual Rev. (Mill.)			*8/10/60 Price About*	*Dividend Rate*	*Approx. Yield*	*Recent Share Earns.*	*% Incr. In Sh. Recent*	*Earn. 5-yr. Aver.*	*Price-Earn. Ratio*	*Div. Payout*	*Approx. Book Value*
$324	S	American Elec. Power ...	55	$1.80	3.3%	$2.39Ma	2%	8%	23.0	75%	$24
63	O	Arizona Pub. Serv.	45	1.20	2.7	*2.05Ma	*14	* 6	*22.0	59	18
13	O	Arkansas Mo. Power	20	1.00c	5.0	1.46Je	10	3	13.7	68	10
38	S	Atlantic City Elec.	37	1.10	3.0	*1.49Je	* 8	* 9	*24.8	74	1?
169	S	Baltimore G. & E.	29	1.00	3.8	1.43Je	4	8	20.3	70	13
8	O	Bangor Hydro-Elec.	43	2.20	5.1	3.35Je	16	5	12.8	66	28
7	O	Black Hills P. & L.	30	1.48	4.9	2.63Ap	17	4	11.4	56	22
116	S	Boston Edison	64	3.00	4.7	3.69De	4	4	17.3	81	51
31	A	Calif. Elec. Power	20	.84	4.2	*1.08Je	*D6	*10	*18.5	78	12
24	O	Calif. Oreg. Power	34	1.60	4.7	*1.87My	*D3	*	*18.2	86	26
10	O	Calif. Pac. Util.	21	.90	4.3	1.42Je	17	4	14.8	63	12
76	S	Carolina P. & L.	40	1.32	3.3	2.32Je	14	6	17.2	57	21
34	S	Cent. Hudson G. & E. ...	23	.92	4.0	*1.44Je	* 7	* 8	*16.0	64	13
26	O	Cent. Ill. E. & G.	39	1.44	3.7	2.31Je	10	12	16.9	62	15
43	S	Cent. Ill. Light	40	1.52	3.8	2.57Je	18	10	15.6	59	18
60	S	Cent. Ill. P. S.	53	1.92	3.6	2.92Je	11	7	18.2	66	20
20	O	Cent. Louisiana Elec.	54	1.80	3.3	2.42Je	16	7	22.3	74	19
42	O	Cent. Maine Power	26	1.40	5.4	*2.04Je	*33	*	*12.7	69	21

Annual Rev. (Mil.)		(Continued)	8/10/60 Price About	Dividend Rate	Approx. Yield	Recent Share Earns.	% Incr. In Sh. Earn. Recent	% Incr. In Sh. Earn. 5-yr. Aver.	Price-Earn. Ratio	Div. Payout	Approx. Book Value
160	S	Cent. & South West	37	.96	2.6	1.38Je	2	6	26.8	70	11
12	O	Cent. Vermont P. S.	20	1.08	5.4	*1.37Je	—	* 2	*14.6	79	13
140	S	Cincinnati G. & E.	39	1.50	3.8	2.14Ma	17	3	18.2	70	16
8	O	Citizens Util. "B"	17	.56	3.3	.73Ma	11	6	23.3	77	4
130	S	Cleve. Elec. Illum.	58	1.80	3.1	3.04Ma	14	9	19.1	59	26
7	O	Colo. Cent. Power	29	.75	2.6	1.22Je	13	6	23.8	61	11
52	S	Columbus & S. O. E.	47	1.80	3.8	2.87Je	38	6	16.4	63	24
454	S	Commonwealth Edison	65	2.00h	5.4h	3.86Je	7	10	16.8	52	33
16	A	Community P. S.	30	1.00	3.3	1.49Je	8	6	20.1	67	12
85	O	Conn. Lt. & Pr.	24	1.20	5.0	*1.48Je	* 7	* 4	*16.2	82	15
615	S	Consol. Edison	64	3.00	4.7	*3.83Je	*12	* 6	*16.7	78	49
258	S	Consumers Power	60	2.60	4.3	3.83Je	14	5	15.6	68	35
90	S	Dayton P. & L.	55	2.40	4.4	3.18Ma	D3	4	17.3	75	30
53	S	Delaware P. & L.	47	1.14	2.4	1.62Je	5	9	29.0	70	26
267	S	Detroit Edison	45	2.00	4.4	2.47Je	6	3	18.2	81	27
156	A	Duke Power	48	1.40c	2.9	2.22Je	5	10	21.6	63	20
101	S	Duquesne Light	26	1.18	4.5	*1.48Je	* 7	* 5	*17.6	80	10
36	O	East. Util. Assoc.	41	2.20	5.4	2.79Je	9	6	14.7	79	26
3	O	Edison Sault Elec.	17	.90	5.3	1.30Ma	3	6	13.0	70	9
17	O	El Paso Elec.	42	1.16	2.8	1.71Je	17	7	24.6	68	11
13	S	Empire Dist. Elec.	34	1.36	4.0	1.89Je	8	7	17.9	72	16
62	S	Florida Power Corp.	35	.80	2.3	1.22Je	13	10	28.7	66	12
155	S	Florida P. & L.	61	.96	1.6	2.03Je	9	17	30.0	47	15
4	O	Florida Pub. Utils.	21	.72	3.4	1.34Ma	30	9	15.7	52	10
231	S	General Pub. Util.	25	1.12	4.5	*1.56Je	* 7	* 7	*16.0	72	15
7	O	Green Mt. Power	20	1.10	5.5	1.42Je	7	3	14.1	77	12
78	S	Gulf States Util.	35	1.00	2.9	1.41Je	11	8	24.8	71	11
54	A	Hartford Electric	61	3.00	4.9	*3.64Je	*D5	NC	*16.8	82	43
27	O	Hawaiian Elec.	56	2.50	4.5	3.48Je	8	7	16.1	72	34
105	S	Houston L. & P.	84	1.60	1.9	3.12Je	7	6	26.9	51	21
34	S	Idaho Power	53	1.80	3.4	2.64Je	21	1	20.0	68	27
104	S	Illinois Power	54	2.00	3.7	2.90Je	21	14	18.6	70	20
54	S	Indianapolis P. & L.	45	1.70	3.8	2.53Ma	11	9	17.8	67	18
33	S	Interstate Power	19	.90	4.7	1.18Je	—	4	16.1	76	8
42	S	Iowa Elec. L. & P.	46	1.80	3.9	2.62Je	21	6	17.6	69	20
51	S	Iowa-Ill. G. & E.	41	1.90c	4.9	2.68Je	10	4	15.3	71	20
47	S	Iowa P. & L.	37	1.60	4.3	2.31Ma	9	3	16.0	69	18
40	O	Iowa Pub. Service	19	.80	4.2	1.26Je	8	4	15.1	64	10
17	O	Iowa Southern Util.	33	1.48	4.5	2.18Je	2	9	15.1	68	20
64	S	Kansas City P. & L.	55	2.20	4.0	3.22Je	10	6	17.1	68	29
36	S	Kansas G. & E.	52	1.64	3.2	2.61Je	D1	7	19.9	63	22
54	S	Kansas P. & L.	38	1.42	3.7	2.46Je	13	9	15.4	58	17
47	O	Kentucky Util.	39	1.60	4.1	2.69Je	3	6	14.5	59	23
8	O	Lake Superior D. P.	25	1.28	5.1	1.73Je	5	4	14.5	74	17
136	S	Long Island Lighting	38	1.40	3.7	*2.15Je	* 9	* 9	*17.7	65	20
66	S	Louisville G. & E.	50	1.40	2.8	2.71Je	18	8	18.5	52	21
12	O	Madison G. & E.	26	1.00	3.9	1.88Ma	1	3	13.8	53	39
5	A	Maine Pub. Serv.	22	1.20	5.5	1.51Je	4	2	14.6	79	14
8	O	Michigan G. & E.	75	1.70e	5.2	5.26Ma	D2	12	14.3	32	29
198	S	Middle South Util.	30	1.00	3.3	1.36Je	4	7	22.0	74	14
31	S	Minn. P. & L.	34	1.60	4.7	2.26Je	D3	5	15.0	71	21
16	S	Missouri P. S.	20	.72f	3.6	1.14Je	20	5	17.5	63	8
8	O	Missouri Util.	30	1.36	4.5	1.68Ma	—	—	17.9	81	18
46	S	Montana Power	32	1.12	3.5	*1.43Je	—	* 8	*22.4	78	9
172	S	New England Elec.	22	1.08	4.9	1.36Je	4	3	16.2	79	15
52	O	New England G. & E.	24	1.16	4.8	1.70Je	D1	5	14.1	68	17
105	S	N. Y. State E. & G.	27	1.20	4.4	*1.81Je	*D7	* 8	*14.9	66	18
285	S	Niagara Mohawk Power	38	1.80	4.7	*2.31Je	*12	—	*16.5	78	23
104	O	Northern Indiana P. S.	60	2.20	3.7	3.32Je	13	5	18.1	66	26
170	S	Northern Sts. Power	28	1.10	3.9	1.46Je	3	6	19.2	75	12
12	O	Northwestern P. S.	22	1.10	5.0	1.75Je	17	6	12.6	63	12
151	S	Ohio Edison	35	1.48	4.2	2.09Je	11	6	16.7	71	17
58	S	Oklahoma G. & E.	32	1.12	3.5	1.39My	D7	6	23.0	81	11
29	S	Orange & Rockland Utils.	37	1.10	3.0	*1.53De	*20	*14	*24.2	72	14
19	O	Otter Tail Power	36	1.80	5.0	2.35Je	D4	6	15.3	77	24

Annual Rev. (Mill.)		(Continued)	8/10/60 Price About	Dividend Rate	Approx. Yield	Recent Share Earns.	% Incr. In Sh. Earn. Recent	% Incr. In Sh. Earn. 5-yr. Aver.	Price-Earn. Ratio	Div. Pay-out	Approx. Book Value
535	S	Pacific G. & E.	65	2.60	4.0	3.89Je	3	5	16.7	67	42
58	O	Pacific P. & L.	38	1.60	4.2	*2.06My	*D7	* 4	*18.4	78	23
138	S	Penn P. & L.	27	1.25	4.6	1.77Je	7	5	15.3	71	13
264	S	Phila. Elec.	52	2.24	4.3	2.91Je	4	5	17.5	77	26
40	O	Portland Gen. Elec.	31	1.20	3.9	1.92Je	14	4	16.1	63	18
82	S	Potomac Elec. Power	30	1.32	4.4	*1.94Je	*36	* 9	*15.5	68	18
102	S	Pub. Serv. of Colo.	61	1.90	3.1	2.79Je	4	6	21.9	68	27
369	S	Pub. Serv. E. & G.	40	1.80	4.5	2.24Je	D7	4	17.9	80	24
88	S	Pub. Serv. of Ind.	48	2.10	4.4	2.65Je	D7	3	18.1	80	27
34	O	Pub. Serv. of N. H.	19	1.04	5.5	1.51Je	D1	2	12.6	69	14
17	O	Pub. Serv. of N. M.	38	1.00	2.6	1.51Je	D2	10	25.2	66	12
32	S	Puget Sound P. & L.	36	1.56	4.3	2.11Ma	4	9	17.1	74	23
72	S	Rochester G. & E.	46	1.80b	3.9	*3.11Je	*D3	* 7	*14.8	58	30
10	S	St. Joseph L. & P.	34	1.60c	4.7	2.28Je	22	6	14.9	70	18
71	S	San Diego G. & E.	30	1.20	4.0	1.89Je	13	8	15.9	63	18
12	O	Savannah E. & P.	31	1.12	3.6	1.26Je	—	1	24.6	89	12
12	O	Sierra Pacific Pr.	44	1.60	3.6	2.51Je	17	14	17.5	64	17
280	S	So. Calif. Edison	63	2.60	4.1	*4.19Je	NC	6	15.2	62	42
56	S	So. Carolina E. & G.	44	1.40	3.2	1.99Je	13	6	22.1	70	19
8	O	Southern Colo. Pr.	19	.90	4.7	1.09Ma	D30	—	17.4	83	13
297	S	Southern Co.	48	1.40	2.9	1.98Je	8	9	24.2	71	17
21	S	So. Indiana G. & E.	36	1.60	4.4	2.58Je	6	2	14.0	62	21
9	O	So. Nevada Power	41	1.10	2.7	2.05Je	15	5	20.0	54	15
4	O	Southwestern E. S.	18	.72	4.0	1.01My	3	5	17.8	71	7
47	S	Southwestern P. S.	26	.84	3.2	1.13Je	16	7	23.0	74	7
36	A	Tampa Electric	33	.72	2.2	1.14Je	27	7	29.0	63	10
183	S	Texas Utils.	79	1.92	2.4	2.98Je	5	9	26.5	64	21
47	S	Toledo Edison	18	.70	3.9	1.10Je	D5	2	16.4	64	9
20	O	Tucson G. E. L. & P.	32	.80	2.5	1.24Je	24	8	25.8	65	9
147	S	Union Electric	39	1.80	4.6	*2.11Je	*23	* 5	*18.5	85	17
39	O	United Illum.	28	1.38	4.9	*1.75Ma	*D1	* 1	*16.0	79	16
6	O	Upper Peninsula Pr.	31	1.60	5.2	2.10Je	22	—	14.8	76	19
50	S	Utah Power & Light	34	1.32	3.9	1.89Je	3	5	18.0	70	19
151	S	Virginia E. & P.	46	1.20	2.6	1.81Je	13	9	25.4	66	17
36	S	Wash. Water Pr.	42	2.00	4.8	*2.38My	*D11	* 7	*17.6	84	29
152	S	West Penn Elec.	40	1.70	4.3	2.33Je	D1	5	17.2	73	18
82	O	West Penn Power	63	3.00	4.8	3.51Je	1	3	17.9	85	26
13	O	Western Lt. & Tel.	44	2.00	4.5	3.34Je	9	6	13.2	60	27
32	O	Western Mass. Cos.	24	1.20	5.0	1.64Je	D1	—	14.6	73	18
134	S	Wisc. El. Pr. (Cons.)	41	1.80	4.4	2.86Ap	21	7	14.3	63	27
48	O	Wisconsin P. & L.	36	1.48	4.1	2.43Je	11	7	14.8	61	21
46	S	Wisconsin P. S.	30	1.30	4.3	2.04Je	10	5	14.7	64	17
		Averages			4.0%		8%	6%	18.2	69%	
		Foreign Companies									
217	S	Amer. & Foreign Pr.	7	$ .50	7.1%	$1.30De	D33%	0%	6.4	38%	$32
151	A	Brazilian Traction	4	—	—	.58De	D10	—	6.9	—	28
97	A	British Col. Pr.	33	1.40	4.1	2.48De	27	9	13.3	56	36
20	O	Calgary Power	21	.40	1.9	.96De	8	18	21.9	42	6
18	A	Gatineau Power	37	1.50	4.1	1.98De	D22	—	18.7	76	21
16	A	Quebec Power	33	1.60	4.8	2.41De	3	9	13.7	66	26
77	A	Shawinigan Water & Pr.	27	.68	2.5	1.45De	D10	8	18.6	47	19

*Deferred taxes resulting from liberalized depreciation are not normalized. If they had been normalized the price-earnings ratio would be higher, and the rate of increase in share earnings would be smaller. D—Decrease. NC—Not comparable. A—American Stock Exchange. O—Over-counter or out-of-town exchange. S—New York Stock Exchange. Ja—January; F—February; Ma—March; Ap—April; My—May; Je—June; Jy—July; Au—August; Se—September; Oc—October; N—November; De—December. b—Also 3 per cent stock dividend (paid January 25, 1960) included in the yield; similar dividends are paid annually, representing balance of earnings. c—Also stock dividend in 1959. e—Also regular annual 3 per cent stock dividend (paid each year end), included in the yield. f—Also regular stock dividend of one-half per cent quarterly, included in yield (paid since 1956). h—Also 2½ per cent stock dividend paid December 1, 1959, included in yield; stock dividends are paid annually, reflecting balance of earnings.

What Others Think

One Hundred Years of Military Communications

From August 1st to the 3rd the National Symposium on Global Communications was held at the Statler-Hilton Hotel in Washington, D. C. This was the fourth annual meeting and close to a thousand specialists, technicians, and executives concerned with all phases of communications met to exchange information under the joint sponsorship of the Institute of Radio Engineers and the United States Army Signal Corps.

A great many of the speeches delivered at the symposium were of a highly technical nature. A good bit of attention was given to satellites and space communications. As you can easily imagine the layman hearing these speeches might have the distinct impression that he was hearing a foreign language spoken.

Of general interest was a speech by Rear Admiral (Retired) Joseph R. Redman, USN, on the past one hundred years of military communications. Admiral Redman is a graduate of the U. S. Naval Academy where he also did advance study. He has seventeen years of sea duty as well as fifteen years of service in positions of great responsibility ashore in his background. In 1946, Admiral Redman retired from the Navy and became vice president of Western Union. He now resides in Washington, D. C., where he coordinates Western Union's activities with the heads of the military and other government agencies. With this background of both military and civilian communications the Admiral's sketch of the development of military communications was most interesting. Military communications, of course, can never truly be separated from civilian facilities for most often the military makes use of existing facilities that are shared with the general population.

Admiral Redman pointed out that the Signal Corps was created in 1860, just a hundred years ago. He noted that during the Civil War, the fire of a Union battery was directed on the Confederate works by an observer using signal flags and he stated that this occurrence at Fort Monroe, Virginia, was probably the first such control of gunfire.

In 1899, when Marconi came to the United States to report the International Yacht Races, officials of the Navy permitted him to try out his wireless telegraph under their auspices. The tests conducted for the Navy in 1900 proved so successful that it seems the system would have been adopted for ship-to-ship and ship-to-shore communications if transmission interference could have been elimi-

nated. The first ten years of the new century, however, did see startling advances made in the field of military communications. In 1907 when the U. S. fleet made its cruise around the world, over twenty ships had deForest radiotelephone equipment.

The World War I period proved most important to the future development of communications. Admiral Redman stated:

> World War I gave great impetus to radio development. This was the first major war in which the Signal Corps participated and they provided more reliable and extensive communications than those known by any previous Army.
>
> The Navy utilized radio extensively for contact between ships and shore and between ships.
>
> Even the small submarine chasers, better known as SC boats, were organized as units and tactically controlled by radiotelephone provided by a CW 936 set manufactured by Western Electric. During this period the Navy commissioned high-power, long wave arc transmitters at Darien, Canal Zone, San Diego, California, Pearl Harbor, territory of Hawaii, and Annapolis, Maryland. Heretofore all high-power shore stations employed spark transmitters. Also, during the war the Navy took over commercial shore stations utilizing some and closing down all others.

THE 1920's saw the Navy research laboratory collaborating with the Carnegie Institution on research on the reflection phenomena and measurement of the Kennelly-Heaviside layer, Admiral Redman stated. In 1938, the first shipboard installation of radar was made and the results of transmitter tests proved to be startling to tactical and gunnery officers. It seems sure that the development of radar as a navigation aid and as a tactical instrument is one of the prime achievements of the World War II period.

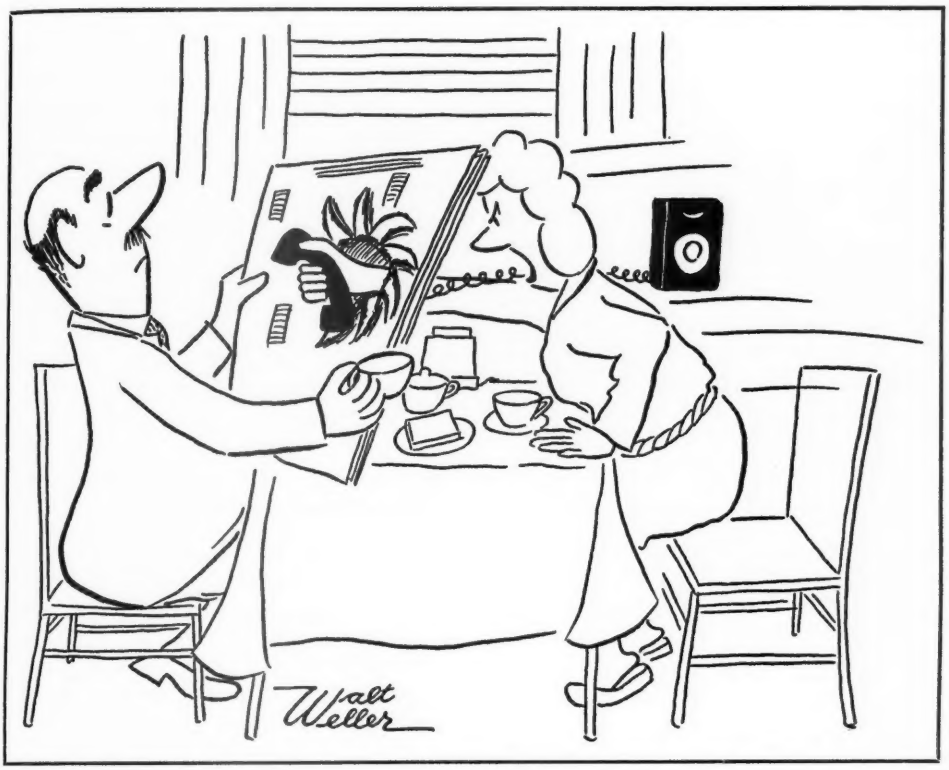
Admiral Redman noted that these were only a few of the high lights of military communications and he stated that the future held much in the potential development of satellite communication systems.

TVA Director on Population Movements

BROOKS HAYS, Tennessee Valley Authority director, speaking at a joint meeting of the Scottsboro, Alabama, civic clubs on August 3rd, stated that rural areas experiencing loss of population in the great country-wide, farm-to-city migration must look to resources and opportunities outside their immediate vicinity and use them to maintain vigorous economic growth.

Mr. Hays noted recent 1960 census figures showing that many of America's largest cities have lost population in the last ten years, giving rise to problems of revenue, taxation, and legislative representation. In principle, the problem of the cities whose people are moving to the suburbs is not greatly different from rural areas, such as Jackson county, Alabama, whose people are moving to urban areas.

Resources and opportunities are never hedged in by political boundaries, the TVA director said. The future of smaller cities and rural counties lies in gearing their activities to the growth of the larger region and in using the resources available to them in this larger context. As an example, he cited the growth of the poultry industry in northern Alabama which has taken place during the same period



"FOR YOU!"

that many of the state's northern counties have sustained population losses. He stated:

> This multimillion-dollar industry is based to a considerable extent on the use of two regional resources—the Tennessee river waterway which brings feed grains from the Midwest at low cost and economical electric power which permits farmers to employ laborsaving devices to the fullest extent. Local initiative has capitalized on these assets to add an important growth factor to this area.

Mr. Hays also noted that the shore line of Guntersville reservoir is dotted with summer homes built by residents of the communities which have shown dynamic growth in recent years, such as Huntsville, Alabama, Birmingham, and Atlanta. This is one way Jackson county obtains a direct benefit from the growth occurring in neighboring areas, he said.

Mr. Hays pointed out that areas such as Scottsboro and Jackson county have an opportunity to plan and develop economically and physically attractive communities. Good schools, well-run public services, and attractive surroundings are important factors to those who are making the decision as to the location of new

industries. He stated that Scottsboro had gone a long way in this respect and he styled that area one of the most "progressive and alert" in the Tennessee valley.

Jackson county has taken other steps such as the development of a 100-acre park on Guntersville Lake. Scottsboro has leased lake-shore land from TVA for a boat harbor.

In relation to population movements, Mr. Hays stated that one of the most important actions the people of the area can take is to make sure that the potential industrial sites along the Tennessee waterway are preserved for their highest economic use. A good combination of rail and water transportation is available. Desirable industrial sites in the vicinity have been identified. As expanding industries find sites on the lower river more scarce and more expensive, those in the local area will have greater attraction.

He stated that when you line them up and count them off, the opportunities presented to the people of Scottsboro and Jackson county are rather impressive. But they will require much energy, farsightedness, and co-operation if they are to be seized and used.

—C. M. B.

Norris Reservoir Development

In mid-August General Herbert D. Vogel (Retired), chairman of the board of directors of the Tennessee Valley Authority (TVA), spoke to the charter members' meeting of the Clinch and Powell River Valley Association at Oak Ridge, Tennessee.

General Vogel stated that the movement of the people of the Tennessee valley, which culminated in the creation of the Tennessee River and Tributaries Association, speaks well for the future achievements of the area. The Clinch-Powell River Valley Association is part of this group. And the activity noted, General Vogel stated, is an awakening to the realization of goals and an acceptance of the fact that the group itself must perform the work necessary to achieve its stated objectives.

It was noted that TVA will continue to foster new lines of co-operation with representatives of government and with local groups, as well as supplying technical assistance to supplement group actions. General Vogel stated:

> I can foresee, as a result of the creation of the Tennessee River and Tributaries Association and its many components, of which this newest is a splendid example, a change of tempo—a faster tempo—that will bring about an optimum industrialization and commercialization of the South many years before it otherwise could have been expected. I think we can achieve within our own lifetime rewards which otherwise might be expected only by our children or our grandchildren.

General Vogel believes that opportunities, which for years have remained unexploited, still exist. He noted that one such opportunity was the Norris reservoir. Although Norris is the largest tributary reservoir in the TVA system, it has remained almost untouched by industry. Despite difficulties which might arise from the wide draw down required in the operation of the reservoir for flood-control purposes, General Vogel felt sure that satisfactory methods could be found to utilize this water supply without creating any danger to the recreational interests of the area.

The Norris reservoir area is served by two railroads. In addition, its raw materials, such as coal, forest resources, and agricultural development, have much that can add to the growing economy. Vogel stated that the most important work that can be done at this time is fact finding and planning. In this connection he stated that communities bordering the project have been alerted to the economic potential which will be created.

Technological advances are also producing some difficulties for TVA, General Vogel stated. Digital computers now supplant long mental processes and the work of many men can now be done by a few. However, these few men must be better trained than were their predecessors. Unemployment is not a necessary result of automation, but the area must be alert to the importance of drawing in new industries. Among those things which make an area attractive to new industries, General Vogel named the following: stable local governments, reasonable taxes, good schools and churches, available housing, low-cost transportation, availability of industrial sites, abundant water and electricity, abundance of raw material, and favorable labor conditions.

GENERAL Vogel stated that when funds are made available by Congress, the extension of the Tennessee waterway system to Clinton will assure the nearness to market that manufacturers demand.

Another advantage of the area is that it is near metropolitan Knoxville which possesses many kinds of services and skills which attract new industries.

It was noted by General Vogel that careful planning would have to be done so that the recreational sites in the area would be preserved. He stated that recreational areas were important because of the tourists they attract and because industries are interested in having such benefits for their personnel. Sounding a note of caution regarding recreational development, he stated:

> . . . Melton Hill dam has been conceived and designed as a multipurpose project to serve the needs of both power and navigation. Its cost as relates to power will be borne by TVA out of power proceeds; the cost relating to navigation will be borne by the federal government as a national responsibility. As we see it, the costs of both functions are well justified on a basis of benefits that will result.

General Vogel observed that TVA could not in good conscience proceed with the expenditure of public funds for projects which were precluded from full realization. He noted that there would be little point in creating the new channel route if industries were unable to find places to locate. Shore lands should be safeguarded for industries without ruling out recreational areas, which should be adequate for local needs. This, General Vogel stated, is the type of problem which can only be solved by working together.

AS a chief aim, General Vogel urged that the association develop a plan which would assure that industry would be adequately served without undue restriction of recreational facilities. In addition he asked that recreational advantages of the area might be promoted to their fullest extent without hampering the area's industrial potentials.

Moral Considerations of Public Service

EVERETT C. MCKEAGE, president of the public utilities commission of California, recently spoke before the annual convention of the California Independent Telephone Association on the subject of "Morality in Public Office."

Mr. McKeage noted that the term "public office" usually denotes a governmental office which is filled through election or by appointment. He stated, however, that this is a restrictive view and that the Munn *v.* Illinois decision of the United States Supreme Court recognized that a public utility performed, in effect, a public function. He stated that this status is the justification for the comprehensive regulation of utilities by governmental authority. Therefore, Mr. McKeage pointed out that his remarks regarding "Morality in Public Office" encompassed the broadest concept of "public office."

Graft and corruption have existed in our government, Mr. McKeage stated, as they have in other countries. As an historic point of interest a good many of the corrupt practices, which one meets in history, have now been prohibited by statute and in some areas constitute a felony in both federal and state jurisdictions. Corrupt conduct in government is not only a matter of bad morals, but, even worse, it is a matter of definitely bad manners. Regarding the high status of "public office," Mr. McKeage stated:

> To be more specific, let me refer to history. Thomas Jefferson, in a day of low morals in public office, took the position that public service is a patriotic duty and that public office is a public trust. Jefferson, when President of the United States, would not permit a relative to occupy a federal position under his jurisdiction. He said that the only reward one could expect to receive from public service is the solemn satisfaction of knowing that he leaves office with hands as clean as they are empty.

Unfaithfulness in public office is regretted. However, he stated that it is almost amusing to observe the lack of public responsibility shown by some public officials. Such conduct, he stated, is not "immorality" but "unmorality," coupled with a "lack of discrimination which is monumental."

MR. MCKEAGE believes that all any public utility should ask for is "fair treatment" at the hands of public authority. He noted that what may appear to be "fair treatment" to a regulator might not appear to be so fair to the utility. Justice, he stated, can only be substantial and it rarely ever can be exact.

He observed that, human nature being what it is, lawyers and litigants count it to their advantage when they know a judge before whom they are to appear. Recent disclosures in the federal regulatory field indicate that there have been some examples of loss in proper perspective and discrimination. Regarding this loss of perspective and discrimination, he stated:

> . . . Let the regulator lose his office and then he finds out why he was so "popular." Thus, it is most difficult to understand how members of regulatory bodies can see fit to take lavish presents and entertainment from those whom they are supposed to regulate. It strains the credulity to say that a person of discretion does not know better than that, and surely it is no compliment to a regulator to be offered such consideration at the hands of the regulated

"PLEASE! WON'T *SOMEBODY* STEP TO THE REAR OF THE BUS?"

industry. Oftentimes, we are forced to the conclusion that there are otherwise intelligent persons who appear to sit up nights trying to devise ways of standing in their own light and creating stumbling blocks to their own progress.

Mr. McKeage noted that any regulated industry which is tempted to secure favors should remember that a regulator who would "sell" himself for one price might be tempted to do the same to a higher bidder. He stated that it is just as important for the regulated industry to observe the ethical course as it is for the regulator to do so. Since the public utility discharges a public trust—or a "public office"—it is as much obliged to adhere to lawful, moral, and ethical standards as is the regulator. If any difference exists it is only in degree related to the special circumstances of the case, he stated.

THIS does not imply that enmity must exist between the regulator and the regulated. Such a state, Mr. McKeage believes, would be contrary to the public interest. What it does imply is a cordial but correct official relation between these two groups. This precludes any regulator from becoming a "pal" of any representative of a regulated industry. In conclusion Mr. McKeage stated that the regulator, as all other public officials, will find his reward for honest and faithful public service in a clean conscience and the sincere knowledge that what has been done has been for the public interest.

Upper Missouri Hydroelectric Development

ON July 16th Assistant Reclamation Commissioner N. B. Bennett, Jr., delivered an address to the Tongue River Electric Co-operative, Inc., at Ashland, Montana.

Commissioner Bennett grew up in Wyoming—only about 70 miles from Ashland—and he served for several years as assistant state engineer and engineer-secretary for the Wyoming Water Conservation Board. After these hitches of state service he returned to the Bureau of Reclamation in 1942.

He stated that although he knew that the co-operative was primarily interested in hearing about the Yellowtail dam and future hydroelectric plans for the Upper Missouri, he could hardly pass up the chance to speak about the general subject of reclamation. He stated that the development of irrigation is the Reclamation Bureau's primary objective and currently more than 8 million irrigated acres have been made possible by projects constructed by the bureau. Going hand in hand with the growth in irrigation has been the development and construction of 40 power plants with a capacity in excess of 5.1 million kilowatts.

In the immediate area, and part of the Missouri river basin project, Commissioner Bennett pointed out that the bureau has completed or has under construction 24 multipurpose dams and reservoirs. Twenty-three of these are on tributaries, with only the bureau's Canyon Ferry dam being on the main stem. Facilities to deliver irrigation water to 147,000 acres and supplemental supplies to 43,000 acres have been completed. In addition, eight units are now under construction which will supply water to an additional 155,000 acres. Present plans for the Missouri river basin anticipate the possible irrigation of 3,788,000 acres. This objective, Commissioner Bennett noted, is years in the future.

IN summarizing the present status of the Missouri river basin program, Commissioner Bennett noted that at the start of this fiscal year, 796,200 kilowatts of capacity were on the line in the eastern division of the project. By the end of this year, there will be a total installed generating capacity of 392,350 kilowatts in the western division. Revenues from sale of power during calendar 1959 came to more than $21.8 million, which represents more than 4.8 billion kilowatt-hours. In relation to present achievements, Commissioner Bennett stated:

> Briefly, that is where the Missouri river basin program stands today. The accomplishments are evident. The Missouri river basin project still has a long way to go, but as new construction begins and each unit moves to completion, it marks the progressive accomplishment of this vast water-resource program. As major flood-control works are completed, you will find major emphasis being placed on work to make water available for irrigation and municipal and industrial uses. As these purposes are accomplished they will have a far-reaching economic effect from which the whole basin will benefit.

The Yellowtail dam is now past the planning and development stage and Commissioner Bennett stated that there is little doubt that it is one of the most important projects in the area. The $2.5 million appropriation which has been voted by the House and reported by the Senate committee is only the beginning

of the financial requirements of this $109 million project. It is Commissioner Bennett's belief that construction of the Yellowtail facility will take the next five years and that its construction and operation, both as a reservoir and hydro power producer, will provide much new employment and other economic opportunities for Montana.

He observed that the next twelve months would see the beginning of the construction of a two-lane road to the dam site and the establishment of a permanent camp near there. He stated that if all progressed according to plans invitations for bids for the first work on the dam site can be issued next fall. Following the awarding of the prime contract, it is the commissioner's belief that appropriations should "step up" to the vicinity of $13 to $25 million a year, for a period of about three years in order to complete the main project. This will naturally be controlled by Congress, which holds the purse strings on such appropriations.

The Yellowtail unit will include the following facilities: the Yellowtail dam, reservoir, power plant, switchyard, and the Yellowtail after-bay dam 2¼ miles downstream from the major structure. The main dam, itself, will be of concrete arch construction with a height of 520 feet and a crest length of 1,445, making the dam one of the highest in the nation.

Construction is scheduled to take place about 45 miles southwest of Hardin near the Big Horn-Carbon county line, just downstream from the confluence of Black Canyon Creek and the Bighorn river. Reservoir capacity will be 1,357,000 acre-feet. The power plant, as contemplated at this time, will have an installed "nameplate" capacity of 200,000 kilowatts. Regarding this power generation, Commissioner Bennett stated:

> The Yellowtail power plant will generate an estimated 800 million kilowatt-hours of hydroelectric energy annually, when all four of its 50,000-kilowatt generating units go on line in the mid-1960's. This, of course, will be a major power supply factor in the Upper Missouri river basin, and mention of it leads me into the second part of my discussion here today—the matter of future power supply.

Commissioner Bennett noted that Secretary of the Interior Seaton had approved power allocations through 1965 for the Missouri river basin eastern area, this being the year when all main stem plants, except Big Bend, will be on the line. Studies indicate a firm power availability in 1965 of 998,500 kilowatts. Requests for delivery of firm power in 1963 now stand at 1,207,926. Commissioner Bennett indicated that there is the possibility that the power supply situation can be eased for a brief interim period. The bureau is now working on a plan to obtain additional power by means of interchange or purchase agreements to supplement firm hydroelectric supply through 1963. At the request of preference customers the plan will contemplate obtaining and selling supplemental power on an "if and when available" basis. In addition, the bureau is about to start a study of the possibilities of using the federal Missouri river basin transmission system to create a basin-wide pool of power resources.

The commissioner stated that it is obvious that the Missouri river basin project does not have enough firm power to continue to meet the demands of preference customers. The obvious conclusion is that co-operatives and all basin prefer-

ence customers should begin or complete planning for supplemental power sources. In spite of the plans to determine the feasibility of co-ordinating all area power supplies by pooling, Commissioner Bennett stated that the burden of supply will fall on the utilities—co-operative and investor financed. He expressed his confidence that the challenge of the future would be met and fulfilled.

Notes on Recent Publications

IN the August 4th edition of the FORTNIGHTLY (Vol. 66, No. 3) there appeared on page 191 a review of a speech by A. P. Hammel, regarding the effects that a nuclear attack might have on the telephone industry. Of considerable interest was the following statement:

> No doubt you begin to surmise that many of our telephone buildings are so constructed that they already have fairly good fall-out protection. . . .

It seems now that Mr. Hammel's speech was a herald for a publication entitled *Fallout Shelter Surveys: Guide for Architects and Engineers,* which has just recently been published by the Office of Civil and Defense Mobilization. This guide provides architects and engineers with up-to-date procedures and standards for determining the fall-out shelter possibilities of existing structures and for modifying structures to improve them as fall-out shelters. These same standards would, of course, be applicable to the designing of fall-out shelters for new structures.

The methods of measuring the amount of radiation protection in any building were developed from radiation penetration studies by the National Bureau of Standards. The studies were sponsored jointly by OCDM and the Department of Defense, with the added co-operation of the National Academy of Sciences and the Atomic Energy Commission.

The guide covers shielding fundamentals and calculations, space and ventilation, water supply and sanitation, power supply, and community survey procedures.

The possibility of a nuclear attack is certainly an appalling one. However, in the present unsettled state of the world the possibility is always there. Contrary to initial estimates, a nuclear attack would not mean instant total extinction of our nation—recovery would be possible if adequate preparations are made. The responsibility resting on the utilities industry in the recovery period is tremendous, indeed. Emergency plans have already been formulated by a number of utilities and this new publication of the OCDM should help the industry evaluate present fall-out protection as well as provide some guide lines for future construction which might embody shelter areas.

FALLOUT SHELTER SURVEYS: GUIDE FOR ARCHITECTS AND ENGINEERS, issued free by the Office of Civil and Defense Mobilization, Battle Creek, Michigan; pp. 52.

THE Atomic Energy Commission has published an 80-page report, entitled "The Community Impact of Peaceful Applications of Atomic Energy" which should be of interest to the electric segment of the utility industry.

The report is based on a study made by the American Municipal Association under contract with the AEC. It deals with the extent of peaceful uses of nuclear materials, the effect of these activities on localities and local government functions, and the programs of federal and state agencies and other groups active in this field. Four and a half pages of definitions, relative to atomic energy, cover everything from "accelerator" to "X-ray." Also included is a selected reading list and a list of educational institutions which have graduate training in radiological health and related fields.

THE COMMUNITY IMPACT OF PEACEFUL APPLICATIONS OF ATOMIC ENERGY, Atomic Energy Commission, available from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Price $1.

The March of Events

Packaged Nuclear Plant for Antarctica

THE Atomic Energy Commission has announced it will negotiate a contract with the Martin Company of Baltimore, Maryland, to supply a packaged nuclear power plant to be used at McMurdo Sound, Antarctica.

The Martin plant, which is the first of several authorized by Congress for installation in the Antarctic, will cost about $3.9 million. It will include a 1,500-kilowatt reactor of the pressurized water type, moderated and cooled with light water.

Upon completion, it will be shipped to McMurdo Sound in units for final assembly.

It should be put into operation early in 1962, as required by the AEC contract.

Alabama

FPC Approves Power Project

THE Alabama Power Company has been authorized by the Federal Power Commission to build a $40.9 million hydroelectric development on the Coosa river in Chilton, Coosa, and Elmore counties. This development is in addition to the $120 million development of the Coosa river, for which a license was issued in 1957.

The authorization included plans for revising the generating capacity of both the Mitchell project and the Jordan No. 1 plant. Mitchell was to have its generating capacity increased to 137,000 kilowatts. Jordan No. 1 was to have a new capacity of 119,000 kilowatts. Jordan No. 2 will initially provide a generating capacity of 150,000 kilowatts with a provision for another 75,000 kilowatts in the future.

California

State Seeks Columbia Power

CALIFORNIA is trying to get itself connected to the Bonneville Power Administration so it can tap the surplus power produced by that agency. It does not want any extension of the preference clause on the power beyond Oregon's southern border into California. In fact, it would support legislation, if such were needed, to guarantee that government power agencies would not get most of the power supply on a statutory priority basis.

Senators Jackson (Democrat, Wash-

ington) and Lusk (Democrat, Oregon) are on record as opposing any transmission of surplus power from the Bonneville system into California, because it might lead to honoring preference demands of public agencies in the state. They definitely would favor legislation to preclude such a situation.

The Senators were aroused originally over the Interior Department's proposal to sell surplus power to Pacific Gas and Electric Company over a small intertie line which would have been built by PG&E and California Oregon Power Company. This contract is still pending, but has been deferred on request of the Senate Interior Committee.

A fight may shape up in Congress during the 1961 session among western states which may be against any federal transmission line exporting kilowatts to California.

District of Columbia

Seek $500,000 for Transit Plans

THE administration in Washington, D. C., has sent a request for $500,000 to the Senate for use by the metropolitan Washington transit planning organization. With the money the new National Capital Transportation Agency would be activated. Upon approval of the funds, the President will send the names of the agency's top officials—an administrator, a deputy administrator, and a five-man advisory board—to the Senate for action.

Altogether 54 jobs will be established, 30 of which would be in planning and programing, and five would be in design and construction.

The basic planning—the paper work—as well as engineering studies, land acquisition, and a blueprint of the transit network, should require about three years to complete. This would permit a start on subway building by 1964 with the first rapid transit train operation possibly by 1968.

It is hoped that an interstate compact might be negotiated by 1962, according to William E. Finley, director of the National Capital Planning Commission.

Florida

Defers Building Nuclear Plant

THE need for further research to determine the feasibility of using beryllium instead of stainless steel as the cladding material for the atomic reactor which Florida Power Corporation and Tampa Electric Company had planned to build at Pierce, Florida, has caused the companies to defer construction for one to two years.

Originally the plant was scheduled to start building this September, with completion in 1963. Another reason for the delay, according to a company spokesman, was the need for reaching a cost-sharing agreement with 14 electric utilities also participating in the project.

When the project was initially launched, it was estimated it would cost about $25 million. Since then this figure has gone up to $29 million and if beryllium is substituted for steel, a sizable additional amount will be required. (Tampa Electric, by comparison, is installing a 175,000-kilowatt, coal-fed plant at a cost of about $17 million—which indicates how much more the atomic plant will cost relatively for a 50,000-kilowatt capacity plant.)

AEC is contributing half the research and development cost of the nuclear plant,

with the other 50 per cent coming from the two Florida companies in conjunction with the East Central Nuclear Group, which is composed of 14 electric utilities in the Ohio valley and neighboring areas.

Georgia

Rapid Transit for Atlanta

An integrated transportation system based on a bold modern concept has been advanced for the metropolitan area of Atlanta. The report contemplates mass transportation by three co-ordinated methods: 1. High-speed rail rapid transit on exclusive grade-separated right of way with nine outlying stations; (2) mass transit vehicles on surface streets—diesel or self-contained electric buses or better —operating as feeders to stations on the rapid transit lines and providing short-haul transportation between stations and to downtown; (3) distribution in the heart of the downtown area by "carveyor"—an adaptation of the moving sidewalk—available only to private motorists who park on the fringe of the downtown area, and to pedestrians.

It was also proposed that the state create a Metropolitan Transit District comprising the six-county Atlanta area, administered by an authority with power to construct rapid transit systems, including related distribution facilities, and to issue bonds to cover construction costs that cannot be feasibly met through user revenues.

Illinois

Asks Gas Delivery Hike

Peoples Gas Light and Coke Company has filed a petition with the Federal Power Commission asking permission to increase the daily delivery capacity of two of its long-distance pipeline subsidiaries by 100 million cubic feet in 1961 at a cost of $23.7 million. If the expansion program is approved, it would increase the daily deliverability of Peoples Gulf Coast Natural Gas Pipeline by 60 million cubic feet to 669 million and Natural Gas Pipeline Company of America's by 40 million to 870 million. Both are subsidiaries of Peoples Gas.

Of the 100 million cubic feet of added capacity, 73 million would be channeled into the Chicago area. Northern Illinois Gas Company would get 30 million cubic feet, Peoples Gas 21 million, Northern Indiana Public Service Company 15 million, and North Shore Gas Company 7 million. It is hoped that the proposed facilities for the additional gas can be put into operation by 1961, according to Eskil I. Bjork, chairman of Peoples Gas.

Kentucky

TVA Limits Site Search to State

The TVA is reported to be concentrating its search for a site to build a steam-electric power plant to southeastern Kentucky, according to Republican Senators Cooper and Morton. TVA Board Chairman Vogel told them that engineering studies are progressing steadily and early indications are that all factors seem to be favorable for a site location in that area. TVA engineers have been conducting studies near Artemus in Knox county.

The steam plant authorized for the eastern TVA areas will ultimately cost between $300 and $400 million. It will consume 4 to 6 million tons of coal annually. The first unit of the proposed plant will cost $100 million.

Oregon

Labor Backs Down on Public Ownership

ALTHOUGH the Oregon AFL-CIO state convention delegates who met in Pendleton, Oregon, August 1st to 5th, generally favored federal development of major river projects, they backed away from sponsorship of any future legislation to establish an Oregon State Power Commission. They said that in the event others should sponsor such legislation it must contain provisions to guarantee the right of collective bargaining by the employees of the commission, and provide for final and binding arbitration on wage disputes and grievances.

At the same time, the convention delegates expressed skepticism of the ability of the state to enter into binding labor agreements because they also stipulated that "such legislation must contain a provision that the foregoing protections to organized labor shall not be separable from the entire act, in the event they are later declared to be unconstitutional."

An effort of a public power group to put a state power commission bill on the Oregon ballot by voter initiative in 1958 failed when not enough support could be generated to obtain the necessary signatures.

Pennsylvania

PUC Drops Power Probe

AN investigation by the state public utility commission of the earnings of Metropolitan Edison Company of Reading, Pennsylvania, has been discontinued because studies disclosed the utility was not making excessive profits.

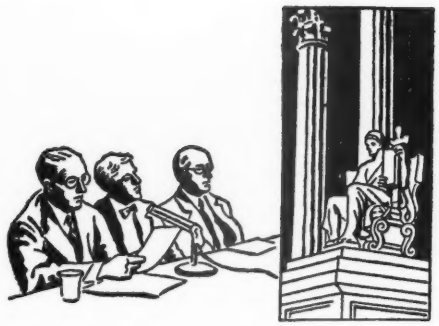
The commission reported that an analysis of the company's operations for the 12-month period ending March 31st showed it was earning around 6 per cent. Operating revenue for the twelve months was listed at $50,193,000, and expense at $37,380,000, including state and federal income taxes. The annual return (or net) was $12,812,000, representing an approximate yield of 6 per cent, which is the approximate amount the state superior court generally holds is fair for public utility profits.

Texas

FPC Tries to Void Escalation Clauses

THE Federal Power Commission, consistent with its efforts to eliminate price escalation clauses in natural gas contracts, has told, in effect, seven south Texas gas producers they probably would get better future prices for their gas if they struck periodic increases from their contracts. The objective of the FPC is to head off higher consumer prices before it has a chance to investigate them, as well as ease its harassing administrative burden.

In the case of producers in Aransas, Calhoun, Brazoria, and Galveston counties being authorized to sell gas at 20 cents a thousand cubic feet to Peoples Gulf Coast Natural Gas Pipeline Company, a subsidiary of Peoples Gas System, Chicago, the FPC specified that escalation clauses were to be changed to provide only one three-cent per thousand increase after ten years.



Progress of Regulation

Trends and Topics

Discrepancies among Tax Value, Rate Base Value, and Real Value

A RECENT announcement by the Oregon Tax Commission as to ratios which counties must apply to the "true cash value" in determining assessed values of utility property directs attention to the inconsistent use of the word "value." Utilities in some states are taxed on the basis of property value as distinguished from cost, while rates are based upon original cost of property less depreciation. This rate base is often termed "fair value."

Disregard of True Value for Tax Purposes

Political expediency calls for low valuation of property for tax purposes, although equality is the important factor. If the assessed value of all property were doubled, in recognition of present values, and if the tax rates were cut in half, the tax paid would not change. Some states prescribe tax value equal to real value, and local assessors disregard the law. In New York state, for example, the law provides that property shall be assessed at "full value" for tax purposes, but disregard of this law by local assessors requires that a State Equalization Board examine assessments and fix the percentages of full value for local tax districts in order to avoid discrimination in such matters as state aid.

Tax Value as Evidence of Rate Base Value

The general rule in rate cases seems to be that assessed value has very little weight in determining the rate base, although some authorities have given consideration to this evidence. The Indiana supreme court decided against the use of the tax value of land for rate-making purposes, where a statute provided that the rate of assessment on lands should not exceed 33⅓ per cent of market or sale value (12 PUR3d 320). The Indiana commission said that tax values, less than 45 per cent of net investment, had little, if any, weight as an element of fair value in a rate case (2 PUR3d 184).

The Montana commission expressed the belief that, standing alone, assessed

value is not a good criterion of physical value but that it does have a relationship with other factors and should be considered. The commission studied records of various assessment rolls involved. The general auditor for the State Board of Equalization had testified that the assessed valuation was about 80 per cent of full value. He explained that capitalized net and stocks and bonds were taken as part of a formula used by the board, but the commission said there was no consideration of reproduction or original cost and that the vagueness surrounding the precise standards used left the commission in considerable doubt as to reliability of assessed value as a measure of plant value (23 PUR3d 233).

Similar views had been expressed previously (1 PUR3d 167; 1 PUR3d 215).

Persons protesting against a rate increase for Lincoln Telephone & Telegraph Company introduced evidence of the assessed value of the company's property and urged the commission to adopt such value for rate-making purposes. The commission said that some courts denied the admissibility of such evidence, but the commission had considered it and did not deem it to be of substantial weight for rate-making purposes (71 PUR NS 129).

The Massachusetts commission in one case said that the plant investment less depreciation substantially corresponded to the value of the property placed upon it by the local assessors. This judgment, it was said, might be accepted as some evidence of value (36 PUR NS 369).

The New York commission, in a proceeding relating to accounting, said that it was "perhaps superfluous" to remark that the commission could not be governed either in valuation or accounting procedure by valuations for tax purposes made on utility property by local tax district assessors. If, in fact, the tax burden was oppressive, as a result of the high assessment, the result was rather to depress the real value of the property, not to raise it, and this was the only inference relevant to the proceeding which could be drawn from the evidence on assessments. A witness had testified that he had made strenuous efforts to secure reduction in assessments but failed to do so (50 PUR NS 101).

The North Carolina commission said it was aware that value for tax purposes is not the same as value for rate purposes. Property is not ordinarily assessed for taxation at its full value. But although tax value is not identical with value for rate purposes, it may properly be taken into account (7 PUR NS 21).

City Not Bound by Tax Assessment

A public utility company, in a case before the Michigan commission, claimed that a city was estopped from contending that the fair value of property was less than the amount at which the city had assessed it. The commission did not agree. It said valuations for purposes of taxation and for purposes of rate making are not necessarily the same. The assessing officers had never made a detailed study of the utility even in an endeavor to fix its value for taxation purposes (PUR1923C 453).

Overlapping of Tax and Rate-making Duties

The Tennessee commission, in a proceeding in which municipalities petitioned for a reduction of rates of Southern Bell Telephone & Telegraph Company, noted that the commission, under the state law, also acts as an assessing board and places values for taxation purposes upon railroad and public utility properties. The commission said, however, that in fixing value for taxation purposes it has before it elements that do not enter into valuations for rate-making purposes, or that, if considered, very little weight should be given to them. The commission took into consideration, for rate-making purposes, its judicial knowledge of how this tax value was arrived at and determined and what elements were given consideration (6 PUR NS 464).

The Utah supreme court considered at some length the relationship between rate base value and the tax base in a proceeding to compel public utility corporations to report to the commission on the value of property under statutes relating to valuation for rate-making and for taxation purposes. The court ruled that a statute providing for such reports and for entry of such values as a maximum rate base, subject to commission changes, must in this suit be considered and construed together with a statute passed at the same session of the legislature providing for assessment of public utility property by the tax commission at the amount so recorded, when it appeared that there was a single plan for the double purpose of assessment for taxation and valuation for rate making.

The court said that the problems of determining fair value as a rate base and value for taxation purposes are extremely complex and have given courts and economists no end of concern. The legislature had attempted "by one single stroke" to solve problems that had baffled the courts ever since government had been controlling rate making by public utilities. The court said that many of the factors are common to both types of valuation, but emphasis is placed at different ends of the scale, emphasis in valuation for rate making being placed upon historical or reproduction cost and emphasis in valuation for taxation being placed upon earning power and market value of stocks and bonds. Fair value as a rate base and value in money for tax purposes, said the court, are not necessarily the same.

The statutes providing for recording utility reports of property value as the maximum rate base and providing that they should be accepted by the tax commission as the basis for taxation, in the opinion of the court, constituted an attempt by the legislature to compel the tax commission to use a valuation basis for assessment of utilities which was, or might under some circumstances be, different from the value of the property in money, contrary to the requirement of the Constitution. The legislature was held to be without power to deprive the tax commission of its constitutional authority to assess public utilities and to adjust and equalize the assessment and valuation of property by placing the power of valuation for tax purposes in the hands of the public service commission (24 PUR NS 305).

Review of Current Cases

Return Exceeding Actual Cost of Money to Electric Company Upheld by Court

THE supreme court of Illinois affirmed an order of the Illinois commission (26 PUR3d 369) authorizing a smaller electric rate increase than that requested by Iowa-Illinois Gas & Electric Company. In so doing, the court reversed a trial court judgment which had reversed and set aside the order.

The commission had found that a return of 5.85 per cent represented a fair rate of return after allowing for all operating expenses. After considering all available data, it had also concluded that the actual cost of the company's capitalization, as opposed to the hypothetical present cost of capital, was 5.44 per cent. Noting that it had examined the entire record before the commission, the court said that while the precise mathematical method employed by the commission and the company might be mooted in economic debate, it could not say that the commission's finding was clearly against the manifest weight of the evidence.

The court said that while a proper judicial review of commission orders requires a study of the reasonableness of the specific findings supporting the ultimate determination of rates, it need not ignore the ultimate result of the order. In this case it would result in an increase of 3½ per cent in revenues before taxes and an increase of over 7 per cent in net income after federal taxes.

Fair Value

The commission had found that the depreciated original cost of the company's facilities allocated to Illinois was $25,547,452 and depreciated reproduction cost was $46,092,122. The court held that there was ample evidence in the record to sustain these figures. The commission had further found that the fair value of the property allocated to Illinois was $31.6 million.

The company complained of this finding, claiming that the rule of the Illinois Bell case (98 PUR NS 379) required the commission to give at least equal weight to reproduction cost as compared with original cost. It argued, therefore, that the finding of fair value was against the manifest weight of the evidence because it was equivalent to a weighting of approximately 25 per cent reproduction cost depreciated and 75 per cent original cost depreciated. The court disagreed, saying that all it held in the Illinois Bell case was that was unreasonable to totally ignore reproduction costs and certain other pertinent factors.

Sufficiency of Findings

The commission had carefully considered and made findings as to the allocation of facilities between Illinois and Iowa—the other state in which the company operated—the depreciated original cost, and the depreciated reproduction cost. It had further considered the methods used to determine the foregoing figures and the lack of evidence with respect to obsolescence. In fact, the reproduction cost study showed that many items were from 220 to 300 per cent over original cost, thereby indicating considerable age and possible obsolescence. The court said that consideration of the complex record in this case gave reason to the rule that the determination of fair value is peculiarly a matter for the commission, which has expert knowledge and great experience in these matters.

Statutory Concept of Fair Value

The court could not agree that the statutory concept of fair value for rate-making purposes can be reduced to a mathematical formula. It observed that fair value of the property of vast utilities cannot be resolved by "pithy slogans of willing buyers and willing sellers" or "the sometimes useful half-truth that the worth of a thing is the price it will bring." Fair value must be determined by sound judgment based upon careful examination of data which are oftentimes complex.

It is not susceptible of exact determination. *Iowa-Illinois Gas & E. Co. v. Illinois Commerce Commission, 167 NE2d 414.*

Weather Given Consideration in Return Allowance

THE Georgia commission held that variations in the weather, within certain reasonable limits, are a normal operating risk of a gas company. As such, it should be given consideration in the determination of a fair rate of return.

The commission set forth the factors pertinent to a determination of the return allowance.

A utility is entitled only to that return on its investment which will keep whole the investment and will induce investors to place capital at the disposal of the utility. Such return should cover the charges on debt, the dividends on preferred stock, and a reasonable return on common equity. While the opinion of management as to the total dollar requirement of the utility deserves consideration, standing alone, it lacks substantial weight.

The commission held that the current cost of money was not less than 6.25 per cent under normal operating conditions. In addition to that amount, it granted an additional one-half of one per cent in order specifically to provide for the possible adverse effects of unusual or abnormal weather conditions.

In determining the rate base, the commission rejected trended original cost. The use of such a measure of value, particularly the use of the Handy-Whitman indices, does not warrant substantial consideration, the commission said.

The order directed the company to amend its schedules to permit customers to transfer firm gas requirements between operating localities, provided such localities were served from the same pipeline delivery point and the company had the physical facilities available to permit such transfer of firm demands. *Re Atlanta Gas Light Co. File No. 19367, Docket No. 1480-U, May 31, 1960.*

Review of Exchange Classifications and Rate Structure Ordered upon Grant of Telephone Rate Increase

GENERAL TELEPHONE COMPANY OF INDIANA, INC., obtained authority from the Indiana commission to increase its net revenues by nearly one million dollars. This will result in a rate of return of 6 per cent on a fair value rate base, according to the commission's calculations.

The company furnishes exchange and toll service in 305 communities through 93 exchanges and 109 central offices located generally in the northern two-thirds of Indiana. It has a 46.7 per cent debt ratio, which was found to be reasonable. Ninety-six per cent of the company's outstanding common stock is owned by Gen-

eral Telephone & Electronics Corporation. The prices which the company pays affiliates for supplies and equipment are competitive, being equal to or less than prices paid by other independent telephone companies. Advisory services are provided by an affiliate at cost. The company has expanded rapidly to meet the demand for service, and further expansion is anticipated.

A proposed amortization of rate case expense over a two-year period was considered unduly pessimistic. A four-year period was prescribed. In estimating future maintenance fund requirements, the commission deducted a judgment amount from maintenance expense for the test year in consequence of "unusually excessive" storm damage during the period.

High Cost of Capital Claimed

Had the increase proposed by the company been allowed, the rate of return would have amounted to 6.7 per cent. Some testimony sought to show a cost of capital approaching 8 per cent, with a necessary return on equity capital of 11½ per cent to 12½ per cent. The commission apparently gave no considerable credence to this testimony in view of its allowance of a 6 per cent rate of return. In any event, it was observed that cost of money is not synonymous with rate of return, though it is one of the factors seriously to be considered.

Valuation Calculations

At the end of June, 1959, the depreciated original cost of the company's plant in service was about $71 million, not including plant under construction or materials and supplies. An estimate of trended cost depreciated amounted to approximately $104 million. A commission engineering report showed depreciated original cost at somewhat over $72 million. The commission found a fair value of not less than $82.5 million, taking into consideration original cost depreciated and current cost less depreciation, as well as the cost of bringing the property to its present state of efficiency. Materials and supplies were allowed. Cash working capital was disallowed since there were ample tax and other accruals to offset the cash requirement. Good will and going concern value were not considered.

Exchange Classification and Rates

Serious difficulties arose in approving tariffs for the company's many exchanges. The large metropolitan areas in which the great bulk of the proposed increase would be drawn were enjoying lower rates than many of the smaller exchanges. The commission agreed with the company that the general classification proposed, based on available calling area, was a proper proposal. However, the overall increase authorized would not be adequate to enable the company to set up the classification it desired on the proposed basis. The commission found that the company should revise its classifications and rate structure, giving due consideration to the revenues here authorized and the number of primary stations available. *Re General Teleph. Co. of Indiana, Inc. No. 28196, May 27, 1960.*

Mutual Telephone Company Area Assigned To Regulated Company

THE Missouri commission ruled that residents of an area inadequately served by an unregulated mutual telephone company were entitled to receive

adequate service from a regulated company. Such an area was said to be considered as uncertificated territory.

The commission is not empowered to compel the mutual company presently purporting to serve the area to improve its service or rehabilitate its facilities. Nor can it require restoration of mutual company service which has been discontinued. The commission has no jurisdiction over a mutual company.

Regulatory authority was conferred upon the commission in order to secure to the public all the advantages of competition in obtaining fair rates and good service, and also to protect against the disadvantages of competition. The public does not enjoy such protection when served by an unregulated company. A regulated company was, therefore, authorized to extend the boundaries of its exchange to include the contested territory. *Re Grand River Mut. Teleph. Corp. Case No. 14410, June 22, 1960.*

Transfer of Unused Carrier Rights Denied

THE Oregon supreme court upheld a commission order which denied a proposed transfer of motor carrier authority to carry bulk petroleum, even though the transfer was between the holder, a sole proprietorship, and its newly formed corporate entity.

Under the controlling Oregon statute the commission must conduct a hearing and determine whether a proposed transfer is in the public interest when the application is competitive or protested, as was the situation in the instant case. The commission had found on substantial evidence that the holder of the permit had never carried petroleum, had no tank trucks, and had received no requests for such service. Furthermore, it appeared that existing carriers provided adequate service.

There is no property right in a commission permit, the court noted, and no vested rights can be accrued by one permit holder for transfer to an applicant for another permit. *Bend-Portland Truck Service, Inc. v. Flagg, 351 P2d 1117.*

Amortization of Previous Rate Case Expenses Disallowed

THE New Jersey commission refused to allow a water company to amortize an amount designated as "unamortized balance of previous case" in a later rate proceeding. The commission cited its previously expressed policy of allowing for rate case purposes the amortization of only the expenses of the current proceeding.

Return on Original Cost

A modified rate increase was granted, which would produce a return of 6 per cent on the end-of-period original cost rate base. The commission had rejected the company's estimate of reproduction cost as a proper measure of value. The commission noted inherent weaknesses in a valuation based upon reproduction costs. The use of such figures are not justified for items that no one would want to reproduce.

The company's net investment rate base figures were also considered improper. Some of the elements in the development of the net investment bases included not only property at original cost, but also an appraisal figure determined at the time

the company merged in 1930, unrecorded retirements, and items which could not be specifically identified.

Rate Base Adjustments

Accrued depreciation attributable to contributions in aid of construction and customers' advances for construction added to the company's rate base calculations were disallowed because provisions for depreciation had been taken upon all of the depreciable property.

Another adjustment related to the company's claim for a cash working capital allowance. The funds were required for the sole purpose of changing the company's method of billing in advance to billing in arrears. The commission held that there was no compelling reason for the company to change its billing method and, therefore, disallowed the cash working capital claim. *Re Laurel Springs Water Works Co. Docket No. 603-234, July 14, 1960.*

State Commission Denied Jurisdiction over Contract Sales By Gas Producer to Generating Plant

A NATURAL gas producer furnishing contract gas to an electric company for use as boiler fuel in the generation of electricity is not a public utility subject to the jurisdiction of the state commission, the California supreme court ruled.

Richfield Oil Corporation, an oil and gas producer, had contracted to furnish gas for boiler fuel to Southern California Edison Company, a public utility, at the new Mandalay steam-electric generating plant which is located in the certificated service area of Southern Counties Gas Company, a regulated utility. Southern Counties objected to the invasion of its territory by Richfield. The California commission had held that Richfield was a public utility subject to its jurisdiction and ordered the producer to discontinue deliveries to Edison since the producer refused to apply for a certificate and submit to regulation.

The state high court annulled the orders.

Dedication of Property Essential

Edison pointed out that Southern Counties could offer it only interruptible service, which would not satisfy its needs, while Richfield was willing to deliver a dependable supply over a long term. Southern Counties and the commission contended that it would defeat the public interest to permit a major producer of gas to commit a significant fraction of the state's gas reserves to a major consumer without regulation. They argued that a gas utility such as Southern Counties, in order to operate economically, must have interruptible customers who can take gas when it is not needed by firm customers, and who can switch to oil when gas service is interrupted.

The court recognized that the state legislature could constitutionally provide for the regulation of Richfield's service to Edison. But this question would not arise unless the commission had been vested, either by the California Constitution or legislation, with jurisdiction over Richfield. It was not contended that the commission's orders were based on its power to regulate Edison.

Richfield contested the commission's jurisdiction over it on the ground that its property had not been dedicated to a public use. Dedication, it was said, is implicit in the constitutional and statutory definitions of public utilities as utilities rendering services "to or for the public"

(under the Constitution) or "to or for the public" (under the Public Utilities Code).

On the other hand, Southern Counties argued that dedication of property to a public use is different from service "to or for the public" or "to the public or any portion thereof," and that the requirement of dedication was engrafted onto the statutory provisions by the court to meet constitutional objections under the due process clause of the United States Constitution. It was further contended that the constitutional objection had not survived the scrutiny of the United States Supreme Court.

Even assuming that dedication as a prerequisite to regulation was imposed initially on the broad language of the Public Utilities Act solely to meet constitutional objections that are no longer valid, said the California supreme court, nevertheless, in view of the history of the act and the substantial reliance on its consistent interpretation and application by the court and the commission for more than forty years, it must be concluded that the legislature by re-enactment of the definitions of public utilities without change has accepted and adopted dedication as an implicit limitation on their terms.

Pipeline Construction Authority

Next, Southern Counties contended that even if Richfield was not subject to regulation as a gas corporation, it was required to secure a certificate of public convenience and necessity to construct a pipeline from its fields to Edison. A section of the Public Utilities Code requires a certificate to be secured by specified utilities, including a gas corporation, for the construction of a line, plant, system, or extension. The court noted, however, that in the past the commission has interpreted this provision as applicable only to public utilities, and it agreed with this administrative interpretation.

No Actual Dedication

The question whether Richfield had dedicated a part of its property to a public use remained. To support its finding that Richfield had dedicated its gas reserves over and above its own requirements, the commission relied on Richfield's disposition of its surplus gas. Richfield has refused to sell gas to industrial users, and it had no plans to sell gas except to Edison and to several gas utilities for peaking purposes.

The resolution of conflicts in testimony relating to the dedication of reserves for peaking purposes was for the commission, the court indicated. And the question remains open, for the commission did not limit its assertion of jurisdiction to Richfield's peaking service. It asserted jurisdiction over all of Richfield's gas reserves and facilities not needed for the producer's own use.

But Richfield's service to Edison was a new service supported by recently acquired reserves not dedicated to peaking services.

Nor did the producer dedicate such reserves by agreeing to sell gas to Edison, said the commission. That sale was made to a selected customer and like service was denied to others.

Common Carrier Dedication Argued

Finally, Southern Counties and the commission sought to show that Richfield had dedicated to public use its pipeline through which it supplies Edison and that it was, therefore, a public utility at least in its use of that line and subject to regulation to that extent. This contention was based on a common carrier condition in Richfield's federal permit to build its line across federal lands. Under

federal law Richfield had agreed to operate the line as a common carrier.

But Richfield, the court observed, uses its pipeline solely to transport its own gas in the course of its nonpublic utility activities and does not seek to use it for the common carriage of gas. Furthermore, it may never be called upon to do so. The state Public Utilities Act is not concerned with Richfield's purely nonpublic utility activities, and the statute's certification provisions may not, therefore, be invoked to prohibit the use of facilities for nonpublic utility activities merely because Richfield may be called upon in the future to make the facilities available for public use.

When and if Richfield is called upon to make its pipeline available for the common carriage of gas, said the court, it may then be determined whether its private use must be curtailed to avoid conflict with any obligation to the public which it assumed in accepting the federal permit subject to the common carrier condition. *Richfield Oil Corp. v. California Pub. Utilities Commission et al. S. F. 20302 et al. July 1, 1960.*

Freedom from Competition Not Guaranteed

THE Pennsylvania superior court, in affirming the commission's grant of additional operating rights to a motor common carrier of passengers, stated that no carrier has a right to be guaranteed freedom from competition. It appeared that a protesting carrier desired to retain a monopoly which the discontinuance of another carrier's operations had created. The applicant in this case had been seeking group and party rights which the defunct carrier had formerly exercised.

The primary object of the public service laws, pointed out the court, is not to establish a monopoly or to guarantee the security of investment in public service corporations, but first and at all times to serve the interests of the public. Whether there shall be competition in any given field, and to what extent, is largely a matter of policy and an administrative question left to the sound judgment and discretion of the commission. The court will not disturb a commission order unless it is clearly shown to be without support in the evidence, or so arbitrary, capricious, and unreasonable as to amount to an error of law or a violation of constitutional rights.

Burden of Proof

Where an applicant seeks to enlarge his authority, the court said, the burden of proof is upon the applicant to establish the need for additional service, the inadequacy of existing service in the area, and his ability to render the proposed service.

No particular type of evidence is required to meet the burden. The only requirement is that the evidence as a whole be legally sufficient to support the commission order. No matter how unimpressive the testimony of the witnesses for the applicants might be, if it is competent testimony, the weight is for the commission to decide.

The court held that the evidence did support the commission's grant of the additional operating rights. It was for the commission to determine whether the available equipment and facilities were sufficient to meet the public demand. It was for the commission to determine the propriety of permitting competition in a particular field in a specific locality. *Reeder v. Pennsylvania Pub. Utility Commission et al. No. 201, June 15, 1960.*

Officers' Salaries Excessive

THE Connecticut commission, pursuant to a legislative mandate to investigate the rates and services of an electric company, held that the evidence presented concerning the duties performed by the officers of a comparatively small electric utility was not persuasive enough to justify the salaries paid. The treasurer of the company was retired and his services were generally those of a consultant. Payments made to him, in the commission's opinion, should more properly have been regarded as a dividend on his stock holdings rather than an expense of conducting the utility business.

The commission noted the difficulty of attempting to evaluate reasonable salaries in relatively small utilities. Salaries paid officers, it said, should not absorb an excessive proportion of revenue. Taking into account the fact that the electric utility was a closely held company, the commission thought there might have been a greater tendency to pay funds to the owners of the company in the form of salaries rather than dividends. For rate-making purposes, the salaries were adjusted downward.

Rate Comparisons

Customers had complained that rates paid were materially higher than those charged by other electric companies in Connecticut. The commission pointed out that, in passing upon the reasonableness of rates, it had to evaluate the needs of each company upon its own merits. Rates could not be prescribed on the basis of comparison with rates of other utilities.

Customer Rate Discrimination

The company was directed to file revised rates which would yield substantially the same amount of gross revenues obtained in 1959, but which would eliminate unwarranted discrimination among classes of ratepayers. Rate disparities among various classes of customers resulted in seasonal-residential and street-lighting customers being serviced at a loss and commercial patrons providing a return of almost 36 per cent. Continuation of such a situation was considered unconscionable. The revised schedules would provide a return of 5.26 per cent on an original cost rate base.

Unnecessary Employee

The commission disallowed the company's claim for $3,560, representing wages paid for services of an employee whose duties, with respect to the company, consisted largely of relaying to other employees calls received on week ends, concerning service problems. In the commission's opinion, the company had not fully explored alternative methods of providing this service. The listing of key employees' telephones at a nominal monthly cost or engaging the services of a commercial answering service were two such alternatives, and the cost of either would not exceed $500 per annum. Therefore, the company's distribution expenses were adjusted downward by $3,060.

Professional Consultant

The company had expended almost $10,000 for the services of various professional consultants engaged to make special rate studies. These unusual and nonrecurring expenses should not fairly be charged against the income for any one year, held the commission. They should be amortized over a five-year period. *Re Bozrah Light & P. Co. Docket No. 9850, July 15, 1960.*

State Wins Damages for Pipeline Crossing of Navigable River

THE Arkansas supreme court held several natural gas pipeline companies liable in nominal damages to the state of Arkansas for constructing pipelines under the bed of the Mississippi river without obtaining proper consent from the state, even though they had certificates from the Federal Power Commission authorizing construction of the lines. A state owns the land under a navigable stream within its boundaries.

The companies did not invoke their eminent domain power conferred by the Natural Gas Act.

The chief contention advanced by the companies was that the Natural Gas Act gave the Federal Power Commission authority to grant permits to cross the beds of navigable waters with interstate pipelines, and that certificates granted by the commission carry with them permits to make such crossings.

Not only does the act fail either specifically or impliedly to give the commission authority to grant such permits, said the court, but if there is any implication one way or the other, it is to the effect that the commission does not have such authority. However, state lands are subject to be taken by eminent domain.

The court indicated that Congress did not grant any easements to the pipeline companies with respect to the beds of navigable rivers, and a company having no authority from Congress cannot legally lay a pipeline under the bed of a navigable stream separating two states, without the consent of the states involved.

Interstate Commerce Unobstructed

Nor did the state's action to recover damages tend to obstruct or interfere with interstate commerce, the court held. While the state could not prevent interstate crossings of the Mississippi, neither had it refused to permit the laying of the lines.

Finally, it was argued that a state statute giving domestic corporations the right to lay pipelines across navigable streams discriminates against foreign corporations. The court noted that this is, in effect, the same right as the companies had under their right of eminent domain—a right they failed to exercise. *Tennessee Gas Transmission Co. et al. v. Arkansas ex rel. Attorney General, 335 SW2d 312.*

Distribution Order Relating to Abandonment Gas Vacated

AT the instance of Michigan Consolidated Gas Company, the United States appeals court for the District of Columbia vacated a Federal Power Commission order which approved a proposal by Panhandle Eastern Pipe Line Company to distribute 157,000 Mcf of gas per day among its resale customers pending final determination of a prior order permitting Panhandle to abandon service of 127,000 Mcf of this gas to Michigan Consolidated. The remaining 30,000 Mcf became available by an expansion in Panhandle's transmission facilities.

The court knew of no reason why the 127,000 Mcf should not be returned to Michigan Consolidated pending final approval of the abandonment. But the court is not equipped, it was noted, to allocate gas between competing parties. The commission could better assess where the balance of hardship would lie if the gas were, or were not, returned to Michigan Consolidated pending final determination of

the abandonment. In order to give the commission an opportunity to make this determination, the court vacated the allocation order and remanded the case. The commission will be free to (1) maintain the status quo, (2) return all of the gas to Michigan Consolidated, or (3) order some division of the gas between Michigan Consolidated and Panhandle.

It appeared that Panhandle and its customers acted at their own risk in attaching new loads under the distribution order, since the court, in allowing the abandonment order to take effect pending appeal, had cautioned the parties that they acted at their own risk.

With respect to the remaining 30,000 Mcf of increased capacity gas, Michigan Consolidated objected that it had been denied intervention in the proceeding authorizing distribution of this gas to Panhandle's purchasers. But the court found no basis for allowing intervention by Michigan Consolidated. *Michigan Consol. Gas Co. v. Federal Power Commission et al. No. 15358, July 11, 1960.*

Other Recent Rulings

Certificate Extension. The New Mexico supreme court affirmed a commission order extending a motor carrier certificate to transport passengers, baggage, and express between two cities where the evidence justified a finding of public convenience and necessity for the proposed service and showed no portion of the route being served by existing carriers. *Transcontinental Bus System v. New Mexico State Corp. Commission et al. 352 P2d 245.*

Past Losses. The Indiana commission held that a utility cannot make up a poor return in past years by an excessive return in future years, nor can it be ordered to make a return which is insufficient on the assumption that future years will result in an average return which would be reasonable if in fact returned in each year over which it has been averaged. *Re Indiana Water Corp. No. 28260, April 8, 1960.*

Railway Express Changes. The California commission granted a railway express agency permission to close all offices serving certain termini, to provide collection and delivery of express shipments by motor trucks operated between a city and certain termini, and to change the waybilling of shipments from the offices closed to a central office thereby increasing certain intrastate charges, upon a showing that revenues had declined substantially and it was necessary to modernize the system. *Re Railway Express Agency, Inc. Decision No. 59927, Application No. 41694, April 12, 1960.*

No Notice, No Jurisdiction. The Indiana commission held that it did not have jurisdiction to authorize a telephone company to borrow money and mortgage property where the utility failed to comply with a statute requiring the publishing of notice of intention to execute a mortgage. *Re Eureka Teleph. Co., Inc. Cause No. 28474, April 14, 1960.*

Telephone Company Sale. The Indiana commission granted permission to one telephone company to purchase the assets of another upon a showing that the purchase price had been arrived at by arm's-length negotiation and was approximately only 5.26 per cent above original cost de-

preciated, that the terms of the sales contract were fair and reasonable, and that the transaction was in the public interest. *Re Indiana Midland Teleph. Corp. et al. No. 28501, April 21, 1960.*

Consolidated Tax Return. The Minnesota commission refused to allow a transit company an income tax deduction on the basis of a 54 per cent federal tax but figured the return on the basis of 53 per cent where the company filed a consolidated return with its affiliates and was, therefore, exempt from the 2 per cent additional tax on consolidated returns. *Re St. Paul City R. Co. Order No. 1488-5, Docket No. 408, June 28, 1960.*

Reasonable Safety Protections. The New Jersey commission held that a public highway and a single main-line railroad track crossing one another at the same level necessitate adoption of reasonable safety protections for the traveling public. *Re Erie R. Co. Docket No. 599-11690, April 28, 1960.*

Contract Passenger Carriage. The New York commission granted a permit to operate as a passenger motor contract carrier, pointing out that, although certificated omnibus operators were generally preferred in their normal service territory over independent charter operators in a contest for a new contract carrier operation, the record had been silent as to the protestants' willingness or ability to provide the required transportation. *Re Laurelton Bus Corp. Case 20880, April 28, 1960.*

Gas Distribution Certificate. The Indiana commission granted a certificate to render gas distribution service in a rural area upon a showing that the applicant had sufficient experience, financial ability, and supply, and would construct additional distribution lines to render adequate service in the territory. *Re Northern Indiana Fuel & Light Co., Inc. No. 28555, May 6, 1960.*

Grade Separation Costs. The California commission held that, in exercising its jurisdiction with respect to grade separation, it should act to impose costs on a public body only when it is clear from the record that some portion of the costs should reasonably be allocated to such public body. *Re Southern P. Co. et al. Decision No. 60168, Application No. 40264, Case No. 6003, May 24, 1960.*

Monopolistic Rights. The Wyoming commission held that an electric utility, over objection, should not be permitted to invade the certificated service area of another to provide service therein, unless the evidence clearly shows a deficiency in service or a forfeiture of rights on the part of the dominant utility. *Re Bridger Valley Electric Asso., Inc. et al. Docket Nos. 9112, 9027, Subs 4-7, June 3, 1960.*

Gas Distribution Certificate. The Illinois commission granted a certificate for the construction, operation, and maintenance of gas distribution facilities upon a showing that the proposed service was in the public interest and that the applicants had been granted franchises from the municipalities involved. *Re Illinois Power Co. Nos. 46743, 46783, June 7, 1960.*

Division of Crossing Costs. The Illinois commission directed that the adjustment of track elevations, in widening of certain crossings, should be accomplished

by and at the expense of the railroad and that the widening and improvement of highway approaches should be by and at the expense of the city. *Gulf, M. & O. R. Co. v. City of Pontiac, No. 45799, June 8, 1960.*

Adjacent Territory Certificated. The Missouri commission granted a certificate to a telephone company to serve an adjacent area upon a showing that there was a need for service by a regulated company and that public benefit would be promoted by having the company located in adjacent territory serve. *Re Kingdom Teleph. Co. Case No. 14,389, June 10, 1960.*

Passenger Train Discontinuance. The Maine commission stated that, in a railroad passenger train discontinuance case, the loss to be incurred by continued service must be weighed against the public convenience and necessity. *Re Canadian National Railways Co. R.R. No. 3511, June 13, 1960.*

Public Utility Status. The California commission held that the owner of a ranch who furnished water to neighbors as an accommodation and had not dedicated his supply to public use was not a public utility subject to its jurisdiction. *Cheshire et al. v. McGuire et al. Decision No. 60259, Case No. 6367, June 14, 1960.*

Conjunctional Billing. The New York commission held that a customer which had not recorded the title to its premises until after the cutoff date specified in an electric company's conjunctional billing tariff was still eligible for conjunctional billing. *Re Consolidated Edison Co. of New York, Inc. Cases 18011, 18013, June 14, 1960.*

Staff Report. The Pennsylvania superior court held that the presumption that the commission considered the testimony of record and all of the controverted points in its deliberation of a case is not overcome by a contention that the commission may have given consideration to a staff report in its decisional process. *Smith v. Pennsylvania Pub. Utility Commission et al. No. 194, June 15, 1960.*

Certificate Construction. The Pennsylvania superior court held that a certificate authorizing the transportation of property did not include the transportation of liquid fuels and gasoline. *Ferry v. Pennsylvania Pub. Utility Commission et al. No. 202-1, June 15, 1960.*

No Due Process Denial. The Pennsylvania superior court held that a city which had been advised that it was geographically involved in a grade-crossing case and had appeared and participated in a hearing thereafter was not denied procedural due process, notwithstanding that three previous exploratory hearings had been conducted in the absence of the city in order to determine the necessity for a change in the crossing. *City of Arnold v. Pennsylvania Pub. Utility Commission, No. 277-1, June 15, 1960.*

Eminent Domain Prerequisite. The supreme court of Illinois held that an interstate pipeline company must obtain state commission aproval before it may institute an action to condemn private property within the state for a perpetual easement. *Service Pipe Line Co. v. Ruder, 167 NE2d 419.*

Service Improvements. The Illinois commission ordered General Telephone Company to reduce the maximum number of subscribers on rural lines to ten

or less, to eliminate free service and establish toll in lieu thereof, or, if the community of interest demanded, establish extended area service, and to make investigations and traffic studies in all instances where the calling rate between two exchanges exceeded five calls per primary station per month. *Illinois Commerce Commission v. General Teleph. Co. of Illinois, No. 45779, June 21, 1960.*

Power to Authorize Abandonment. The Tennessee supreme court held that the commission does not have authority to permit a carrier having two certificates to abandon a segment of one and tack the remaining authority to the second certificate in order to enable it to operate a route which it could not have used under the two certificates as originally issued. *Tennessee-Carolina Transportation, Inc. et al. v. Pentecost et al. 334 SW2d 950.*

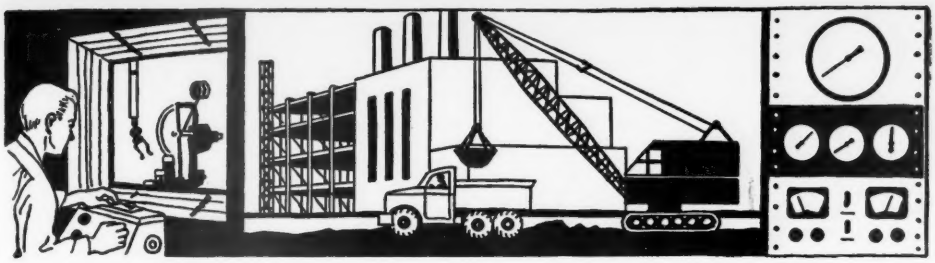
Intervention Denied. The Federal Power Commission considered remote and conjectural the interest alleged by the New York commission to justify intervention in a gas proceeding before the federal body, where it was urged that unconditional certification of producer sales at proposed initial prices in certain production areas would tend to affect adversely future gas purchase negotiations and redetermination clauses of pipelines serving New York. *Re Coastal Transmission Corp. et al. Docket Nos. G-18338 et al. May 31, 1960.*

Flat Water Rate. The Wisconsin commission considered it reasonable for a newly established water utility to apply a flat rate to residential and small commercial customers until sufficient funds to buy meters could be accumulated, especially in view of the use of private sewerage facilities in the area which would tend to restrict the waste of water. *Re Village of Plainfield, CA-3863, June 6, 1960.*

Separations Studies Unreliable. The Florida commission denied a petition by a number of motor carriers for a 10 per cent rate increase, where it appeared that their separations studies between intrastate and interstate operations were unreliable because of the use of an atypical test day and an improper assignment of deadhead mileage to intrastate costs. *Re Florida Intrastate Rate Bureau et al. Docket No. 5930-CCT, Order No. 4994, June 8, 1960.*

Scope of Suspension Order. The Federal Power Commission ruled that it would be improper to allow a suspension order to affect a pending controversy involving the question of presently effective and past rates of a natural gas company which has filed a new rate schedule, notwithstanding a contention by the company that the failure to determine the presently effective rate would prevent it from attaching a satisfactory undertaking to a motion to put the proposed new rates into effect. *Re Pan American Petroleum Corp. et al. Docket Nos. RI60-208 et al. June 14, 1960.*

Proposed Gas Rates Approved. A rate increase for a gas company was approved by the Missouri commission as proposed, since it will result in a rate of return of 5.58 per cent on a fair value rate base, but the new rates were made subject to modification depending upon final determination of the cost of purchased gas under federal regulation. *Re Missouri Utilities Co. Case No. 14,385, June 21, 1960.*



Industrial Progress

ampa Electric Plans to Build Fourth Power Plant

ANS for a fourth power plant to e the electrical requirements of its vice area have been announced by mpa Electric Company.

Although actual construction plans e not been firmed up as yet, the ity firm revealed that some 150 es of land approximately 10 miles th of Tampa will be utilized for site of the new plant.

The new power plant, when con-ucted, will be similar to Tampa ctric's Gannon station at Black nt. It will be coal-fired and will e a deep water channel some 200 t wide and 35 feet deep in order coal can be brought in by ship. l unloading facilities will also be vided, utility officials announced. Actual operation of the new plant probably begin sometime in the 1960's. Preliminary engineering dredging at the site will possibly t about five years in advance of actual operating date.

Acquisition of the new plant site, mpa Electric officials said, is part the firm's long range construction ns. The utility announced earlier year that plans are already laid t would see Tampa Electric's pres-facilities approximately doubled at ost of some $150,000,000 within next five years. Plans for the rth power plant are even further the future than this.

Scheduled for completion by Octo-1 of this year is the third unit at firm's Gannon power plant. This t, 175,000 kilowatts in capacity, l be the largest generating unit on mpa Electric's system. Two units 130,000 kilowatts each are already operation at Gannon. Major equip-nt for a fourth unit at Gannon, this be 190,000 kilowatts, is already on der and is scheduled to be completed 1963. Plans also call for additional units at Gannon prior to actual construction of the Company's fourth power plant.

Computer "Memories" Linked by Long Distance Phone Calls

TWO widely separated computers can now exchange information directly over the telephone—while each continues to print out the results of calculations.

This achievement was announced recently by International Business Machines Corporation with the introduction of its 1009 data transmission unit. The new product is designed to link the magnetic core memories of solid-state IBM 1401 computers over regular local or long distance telephone and telegraph lines. It enables two-way communication between computers at the rate of 150 numbers or letters a second.

Gilbert E. Jones, president of the company's Data Processing Division, said, "In this new trend in IBM Teleprocessing our engineers have made the computer itself act as a data transmission terminal while still retaining internal processing abilities. It is designed to meet the high-volume processing needs of decentralized businesses utilizing high-speed equipment such as the 1401."

The IBM 1009 enables the 1401 computer to be used as either a data transmission or data receiving terminal, as well as a regular data processing system. Input for transmission can be fed into the computer from punched cards or magnetic tape. Business or scientific data is transmitted from the core storage of one 1401 to the core storage of another 1401 at the receiving end. Here, the data can be processed and recorded in the form of punched cards, magnetic tapes, or printed documents on the 600 line-a-minute printer.

While information is being transmitted and received, both 1401 systems are free to perform simultaneous tape-to-printer operations. When not in use for sending or receiving, the 1401 can be used for full data processing operations.

The IBM 1009 data transmission unit is especially designed for use in industries where diversified operations can benefit from centralized data processing facilities. Among these are the fields of insurance, petroleum, manufacturing, public utilities, and transportation.

Electro-Motive Introduces Lowest Priced Specialized Peaking Plant

THE introduction of the lowest priced specialized peaking plant ever marketed in the United States was announced recently by Electro-Motive Division of General Motors, La Grange, Illinois.

"This newest addition to Electro-Motive's line of Diesel peaking and reserve power plants—the 10,000 kilowatt MU-100—carries a price of $82 per kilowatt, at the factory," said Richard L. Terrell, vice president of General Motors and general manager of the Electro-Motive Division. In addition to being the most economical peaking and reserve plant on the market today, the MU-100, because of its size can provide peak generation capability to meet the needs of even the nation's largest utility companies, he said.

"But," said Mr. Terrell, "although the MU-100 can fulfill peaking demands of the largest utility company, it still retains the advantages of the small power plant needed at decentralized load centers. The MU-100 increases the capacity of our peaking plant, and, at the same time, increases its economic value to the utilities."

Redesign of Electro-Motive's existing peaking plant control station has

(*Continued on page* 20)

permitted addition of switchgear and controls for the MU-100. By adding more generating units, each utilizing the General Motors 567D turbo-charged engine as prime mover, Electro-Motive's peaking line now consists of power plants ranging from 2000 KW to 10,000 KW size.

Electro-Motive Diesel peaking plants are now operating or soon will be in operation at 13 locations in all major geographic areas of the United States, plus several foreign countries.

G-E Seeks Oldest Carrier-Current Being Used Today

GENERAL Electric Company, this year marking its 40th anniversary in the power-line carrier-current field, is conducting a nationwide search for its oldest equipment in operation today.

Carrier-current being used by electric utilities in four different product categories—telephone sets, pilot relay sets coupling capacitors and line traps—is being sought, E. W. Kenefake, carrier-current sales manager, sai

The winning utility in each cate will receive from G-E, as an award the oldest unit, the company's pre functional equivalent, incorpora the newest advances in th field.

The old equipment, wh n repla will be offered by G-E fo permar museum display. The 40th anni sary quest ends Septembe 30th.

Announce Literature for New Kaylo Product

OWENS-CORNING Fiberglas published a four-page brochure scribing and illustrating it new p uct, Kaylo-Klad high temperature sulation for industrial piping in power, chemical and refining ind tries.

Copies of the brochure may be tained, without charge, by wri Department 55-C, Sales Divis Owens-Corning Fiberglas, 717 F avenue, New York 22, New Yor

McCabe-Powers Announces N Version of Series 400 Line

McCABE-POWERS Body C pany, St. Louis, Missouri, has nounced the production of the 1 version of its widely-used Series Line Construction and Maintena Body.

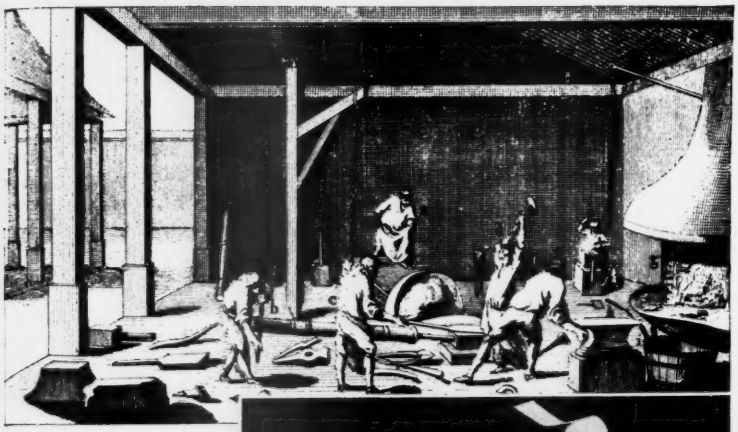
Company vice president, Bro Daly, stated that the 400 incorpora many of the construction features work-speeding advantages found clusively in the firm's Powers-Am can line of heavy-duty line constr tion bodies. "This unit is designed maximum efficiency with a two- three-man crew," he said, "and been adopted as the primary 'wo horse' by many smaller utili throughout the country. It has a been added to the fleets of many la utility operations to supplem heavy-duty units and to handle seco ary line construction and maintena work."

The body is most-frequently f nished with the company's Series P 10 or PM-20 "Pole-Master" Hydra lic Derrick for handling poles up 40′ in length. Optional equipment a includes the firm's Series DP "Earth-Master" Hydraulic Digg which is suspended from the derri and can be used to dig holes from 9 to 24 in. in diameter to 10 ft. 6 in. depth.

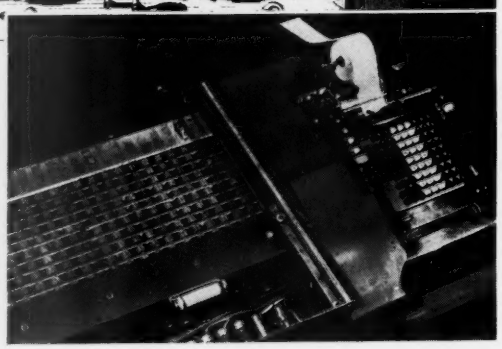
Descriptive literature and pr information can be obtained from M Cabe-Powers Body Company, 50 North Broadway, St. Louis 15, M

(*Continued on page 24*)

many steps vs. "ONE"



Six smiths are engaged here in laboriously hand-welding layers of steel to an anvil — an article of prime importance to their own trade, toolmaking.



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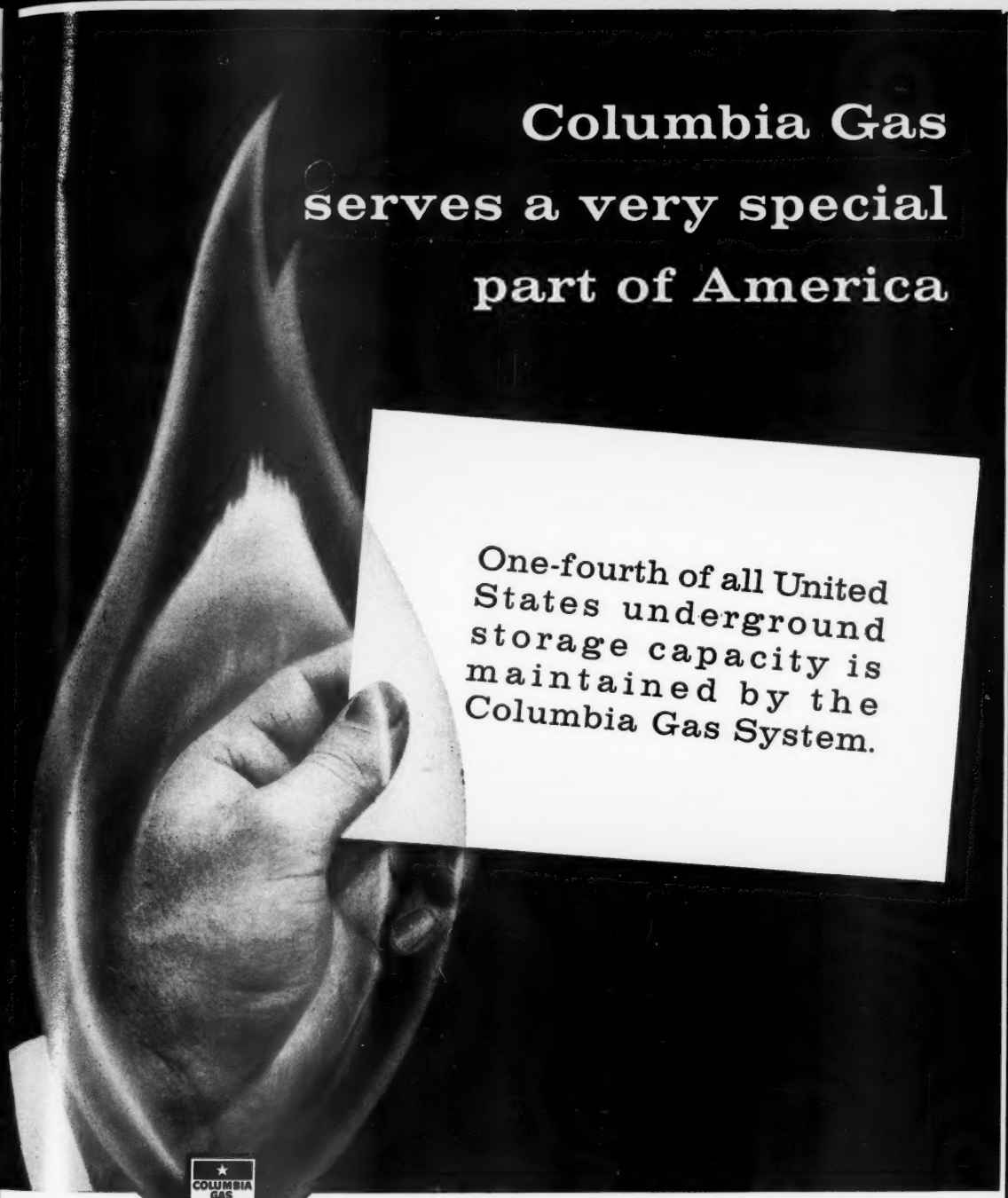
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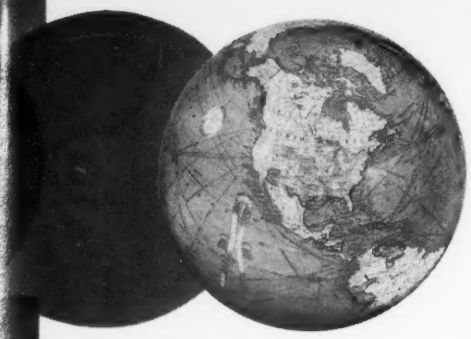

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Union Electric Buys Land For New Power Plant

UNION Electric Company announced recently it is acquiring land along the Alton Pool of the Mississippi river in St. Charles County as a future site for a large steam power station.

The plant, which will eventually have at least 1,500,000 kilowatts of capacity, is being planned as a four section plant similar to the Meramec plant just now being completed in south St. Louis county. The proposed new plant, however, will produce at least fifty per cent more electricity than the Meramec station.

The date for starting construction is not yet fixed, G. P. Gamble, executive vice-president-operations, said, but it is expected construction of the first section will start within the next few years. The final section will not be completed until the 1970's.

The plant will be located on the river because of the quantities of cooling water required and the possibility for river barging of coal. There will be no hydroelectric power features included in the project.

The company, with completion of the Meramec plant, scheduled for next spring, will have 2,250,000 kilowatts of capacity. The Taum Sauk pumped storage plant will provide an additional 350,000 kilowatts of peaking power when it is finished in 1963. The highest demand of the system so far was 1,885,000 kilowatts which occurred during a recent hot weather spell. Load growth studies indicate, Mr. Gamble said, that electric consumption will continue to follow the historic pattern of doubling about each ten year period.

New Electrical Generating Equipment Orders Show Decided Upturn in First Half of 1960

ELECTRICAL generating equipment ordered by United States power systems from domestic sources for the first half of 1960 showed a capacity increase of 70 percent over the same period of 1959, according to the Electric Power Survey Committee of the Edison Electric Institute.

Orders for steam generators (boilers) rose 97 percent over a year ago, while hydraulic turbine orders were up by 212 percent and power transformer orders increased by 96 cent.

The individual number of erating units ordered tot led 63 increase of 58 percent o r the half of 1959. The smal r perc age gain in number of nits pared with the capacity ncrease dicates a continuation o the t toward the use of large and la units.

The Committee repo ed tha total of 6,856,245 kilow ts of capacity was ordered by he end June, compared with 4,0 3,250 watts ordered during the ame pe last year.

This brings the total of schedu additions to generating apacity the period starting with 1960 u 45,330,777 kilowatts, of which 910,700 kilowatts are in ther units.

For the first time, two thermal g erating units of 600,000 kilow capacity or larger were on order. Committee also noted that the amo of capacity represented by st units in sizes below 100,000 k watts is only 7.3 percent. As of April, the corresponding figure 7.6 percent and a year ago it 8.5 percent. Eighty percent of capacity ordered was in units of 1 000 kilowatts or more.

G-E Reports Growing Utili Support for Prefered Desig Power Transformers

MORE than 60 percent of Gen Electric's 1960 power transfor orders to date have been for P ferred Design units according to announcement by the compan Power Transformer Department Pittsfield, Mass.

The Preferred Design progra announced by the company last y is a revolutionary concept in the sign and manufacture of large pow transformers rated as high as 250,0 kva, 230 kv. The purpose of program is to help fight inflation reducing manufacturing costs. Bas ally, this is accomplished by adopti uniform mechanical (exterior) f tures which permit mech nized p duction line techniques for the fi time in the manufactur of lar power transformers. Als report was the fact that the com any's f tory renovation progra n is schedule.

According to G. A. Ho t, depa ment General Manager, th respon of electric utilities has bee extrem

(*Continued on pag 26*)

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ly encouraging. One customer was quoted as saying that Preferred Design represents "the best thing in power transformers in 20 years." Others, Mr. Hoyt said, have realistically analyzed their transformer specifications, removing many longstanding mechanical-type requirements which today are not considered important. This type of utility cooperation has permitted General Electric to quote PD units in many situations where before this would have been impossible.

According to Mr. Hoyt, the impetus toward revising specifications resulted from the realization by utilities that the key to manufacturing progress and economies for which the U. S. A. is noted, is a high degree of mechanical uniformity. He emphasized, however, that the company has found a way to effect these economies without asking utility customers to standardize on electrical ratings.

While utility acceptance of Preferred Design power transformers is high, General Electric is meeting with customers to iron out application and other problems. Product planning visits have been made to some 35 utilities and consulting firms, some of which have had PD units in service since early last year. These visits are designed to provide the department with an across-the-board reaction to the Preferred Design concept and the benefits of experience that customers have had.

REA Approves Five Telephone Loans

The Rural Electrification Administration approved five telephone loans recently to provide new or improved telephone service to 1,178 subscribers in Indiana, Minnesota, North Dakota, Texas and Wisconsin, the U. S. Department of Agriculture announced. About one-third of the subscribers will receive telephone service for the first time.

Facilities to be financed by the loan funds include 251 miles of new line, the rebuilding of 28 miles of existing line.

Westinghouse Gets $20 Million Order to Build Power Plant

A DIVISION of Westinghouse Electric Corp., Westinghouse Electric International Co., has announced it has received a $20 million contract to build a 225,000 kilowatt power station near Tia Juana, Mexico. The order was placed by Mexico's Commission Federal Electrici-Dada.

The three 75,000 kw steam elec generating units for the plant the largest single export order steam electric power equipment e received by the company. The Juana electric plant, it is reported among the first of a $1 billion p gram of electrical develo ment signed to double Mexico' total stalled capacity in the next five yea

Osmose Executives Named New Positions

TWO of the key personnel of Osmose Wood Preserving Co. America, Inc., have been assigned new top-management posts, accordi to John L. Surdam, president of mose. They are—William D. Kie and Scott Hockenbery.

Mr. Kieber, presently field super tendent of the Utilities Division Osmose, will become manager of t division. The Osmose Utility Di sion specializes in groundline insp tion and treatment of standing wo poles for power transmission and te phone companies.

Mr. Hockenbery will move up fr Field Superintendent to Manager Pole Sprayers, Inc., a wholly-own subsidiary of Osmose Wood Prese ing Company. This firm specializes above-ground treatment of in-pla wooden poles maintained by util companies.

The Osmose Wood Preserving with its main office at 980 Ellic Street, Buffalo, N. Y., is one of nation's leading companies in the fi of wood preservation, serving as c tractors in that field for many of country's largest utilities.

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A NEW line of fittings for all int locked armor cable now commercia available has been announced by G& Electric Specialty Company. Series 800 Fittings not only termina but also support, ground, mount a dead end the cable.

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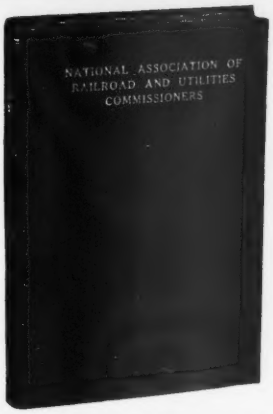
More information may be obtain by requesting Catalog H from G& Electric Specialty Co., 3500 W 127th Street, Blue Island, Illinois.



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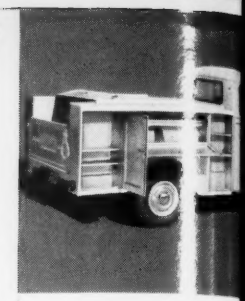

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